



SIERRA LEONE.

Annual
MEDICAL AND SANITARY
REPORT

FOR THE YEAR

1924.

FREETOWN :
Printed at the Government Printing Office
SIERRA LEONE


1925.





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N.B.—The three graphs referred to in the body
of the report will follow.



A N N U A L

Medical and Sanitary Report

1924.

MEDICAL AND SANITARY DEPARTMENT,

FREETOWN, SIERRA LEONE,

3rd July, 1925.

THE HONOURABLE THE COLONIAL SECRETARY, FREETOWN.

SIR,

I have the honour to submit, for the information of His Excellency the Governor, the Medical and Sanitary report on the health and sanitary condition of Sierra Leone for the year 1924, together with the returns, etc., appended thereto.

I have the honour to be,

SIR,

Your obedient servant,

W. D. INNESS,

Director of Medical and Sanitary Services.

I—ADMINISTRATIVE.

(i) ESTABLISHMENT, INCLUDING VACANCIES.

A—MEDICAL STAFF.

- 1 Director of Medical and Sanitary Services
- 1 Deputy Director of Sanitary Service
- 1 Deputy Director of Medical Service
- 1 Senior Sanitary Officer
- 2 Senior Medical Officers
- 1 Medical Officer of Health
- 8 Medical Officers of the West African Medical Staff
- 7 African Medical Officers.

B—NURSING STAFF.

- 1 Matron, Connaught Hospital
- 2 Senior Nursing Sisters
- 2 Nursing Sisters.

C—SUBORDINATE MEDICAL AND SANITARY STAFF.

- 2 Superintendent Sanitary Inspectors (European)
- 32 Dispensers (including Store-keepers, who must be qualified Dispensers)
- 2 African Senior Female Nurses
- 25 African Male Nurses and Apprentices
- 22 African Female Nurses and Probationers
- 29 Sanitary Inspectors and Learners
- 1 Lunatic Asylum Keeper
- 1 Assistant Keeper
- 3 Assistants
- 1 Laboratory Assistant
- 1 Vaccinator.

D—CLERICAL STAFF.

14 Clerks—one first grade, two second grade, four third grade and seven fourth grade.

E—TEMPORARY ASSISTANCE.

Dr. W. F. O. Taylor was employed from 22nd July to the end of the year as temporary medical officer.

F—PRINCIPAL ACTING APPOINTMENTS.

(Substantive holders are given on Table I).

2. Dr. H. O'Hara May acted as Director of Medical and Sanitary Services, from 1st January to 19th August.

3. Major W. H. Peacock acted as Director of Medical and Sanitary Services, from 30th August to 30th September, and as Deputy Director of Sanitary Service, from 1st January to 19th August.

4. Dr. J. Y. Wood acted as Senior Medical Officer, from 23rd July to 31st December.

5. Dr. W. A. A. Malone acted as Medical Officer of Health, from 26th February to 5th December.

6. Miss L. Stevens acted as Matron, Connaught Hospital, from 16th April to 5th September.

(ii) FINANCIAL.

7. The following tables give the comparative revenue and expenditure for the years 1923 and 1924:—

Medical Revenue.				1923.			1924.		
				£	s.	d.	£	s.	d.
Connaught Hospital receipts	...	...	...	164	12	6	151	6	6
Nursing Home receipts	...	...	...	663	19	6	838	9	9
Sale of medicines	...	...	...	172	2	7	189	3	6
Druggist fees (registration)	...	...	...	7	10	0	3	10	0
Medical Practitioner's fees (registration)	...	...	...	6	0	0	1	0	0
Maintenance of lunatics	...	...	...	186	19	7	190	2	1
Departmental fines	...	...	...	11	1	6	17	14	8
Total	...	...	...	£1,212	5	8	£1,391	6	6
Medical Expenditure.									
				£	s.	d.	£	s.	d.
Personal Emoluments	...	...	...	28,607	13	0	27,643	13	3
Other Charges	...	...	...	14,062	18	3	14,052	10	7
Total	...	...	...	£42,670	11	3	£41,696	3	10
Sanitary Revenue.									
				£	s.	d.	£	s.	d.
Sanitary Services (contributions by Bonthe)	...	...	...	275	12	3	367	9	7
Maintenance of persons in quarantine	...	...	...	19	10	0	71	19	3
Total	...	...	...	£295	2	3	£442	8	10
Sanitary Expenditure.									
				£	s.	d.	£	s.	d.
Personal Emoluments	...	...	...	7,459	15	1	7,726	18	4
Other Charges	...	...	...	10,518	10	3	11,588	10	0
Total	...	...	...	£17,978	5	4	£19,315	8	4

ANALYSIS OF HOSPITAL EXPENDITURE.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Institution.	Total number of patients.	Daily average number of patients.	Hospital days.	Provisions from Store-keeper. Total.	Fresh provisions. Total.	5 and 6 per patient per day.	Wines, Spirits, Minerals, Tobacco, Ice Total.	8 per patient per day.	7 and 9 per patient per day.	Fuel, Light. Total.	Miscellaneous : cleaning materials, hospital equipment, replacements.	Total of 5, 6, 8, 11 and 12.	5, 6, 8, 11 and 12 per patient per day.	Total sum recoverable from paying patients.
Nursing Home ...	150	3.25	1,353	£ s. d. 57 4 0	£ s. d. 238 12 4	£ s. d. 0 4 4	£ s. d. 44 6 4	£ s. d. 0 0 7 $\frac{3}{4}$	£ s. d. 0 4 11 $\frac{3}{4}$	£ s. d. 19 0 0	£ s. d. 51 10 4	£ s. d. 410 13 0	£ s. d. 0 6 1	£ s. d. 663 19 6
Connaught Hospital ...	1,818	61.17	22,443	739 14 10	869 11 11	0 1 5	46 18 0	0 0 0 $\frac{1}{2}$	0 1 5 $\frac{1}{4}$	141 18 0	65 4 0	1,863 2 9	0 1 7 $\frac{1}{4}$	78 18 6
Lanatic Asylum ...	1,140	96.12	35,169	25 0 0	963 18 0	0 0 6 $\frac{1}{4}$	27 6 0	0 0 0 $\frac{1}{4}$	0 0 6 $\frac{1}{2}$	39 15 0	32 6 0	1,028 5 0	0 0 7	27 12 0
Kissy Infirmaryes ...	836	47.12	17,284	22 18 0	537 17 9	0 0 7 $\frac{3}{4}$	15 15 0	0 0 0 $\frac{1}{4}$	0 0 8	54 3 0	31 14 0	662 7 9	0 0 9	...
Bonthe Hospital ...	163	10.60	3,681	23 4 10 $\frac{1}{2}$	186 4 3	0 1 0 $\frac{1}{4}$	...	...	0 1 0 $\frac{1}{4}$	10 1 7	4 9 6 $\frac{1}{4}$	224 0 2 $\frac{3}{4}$	0 1 2 $\frac{1}{4}$	7 11 6

II—PUBLIC HEALTH.

(i) GENERAL REMARKS.

8. The general health of the European community may on the whole be considered satisfactory.

9. The invaliding rates per 100 residents was 7.92 as compared with 13.72 for the previous year.

The invaliding rate for the past ten years is shown below:—

Year.	Average Number Resident.	Total Number Invalidings.	Percentage of Invalidings to Average Resident.	Remarks.
1915	158	7	4.43	Records destroyed in hospital fire. 3rd February, 1920.
1916	172	8	4.65	
1917	110	9	8.18	
1918	97	11	11.34	
1919 ... ..	...	...	...
1920	133	10	7.51	
1921	144	15	10.41	
1922	109	5	4.58	
1923	102	14	13.72	
1924	164	13	7.92	

10. Malaria was as usual the most common individual cause of sickness. Sixty-one among in-patients and fifty-eight out-patients in a total of 152 and 395 cases, respectively.

Table showing relative position of malaria as a cause of time lost through sickness (excluding Imperial troops):—

YEAR.	Average Resident.	Total Sick Days.	Total Days spent on Sick List for Malaria.	Total Days spent on Sick List for other Causes.	Percentage of Malaria Days to Total Days.	Number of Days lost through Malaria per year per 100 Residents.
1921	144	1,815	938	877	51.68	651
1922	109	1,426	590	836	41.37	541
1923	102	1,462	319	1,143	21.81	312
1924	164	1,382	446	936	32.27	271

11. The final column showing the decrease during the past four years in the number of days lost through malaria is of considerable interest.

Among the African officials the general health remained fairly good.

12. The invaliding rate shows a slight increase and the death-rate a small decrease.

13. The following are the total cases treated in Government hospitals and dispensaries:—

					1922.	1923.	1924.
IN-PATIENTS—							
Europeans	...	...	...	...	126	131	152
Africans	...	...	...	...	2,787	3,154	3,381
OUT-PATIENTS—							
Europeans	...	...	...	...	233	170	395
Africans	...	...	...	...	48,540	46,805	53,270
Total	...	...	...	...	51,686	50,260	57,198
DEATHS—							
Europeans	...	...	...	...	7	2	3
Africans	...	...	...	...	225	197	231
Percentage of deaths to total number treated ...					232 44	199 39	234 40

14. There is an increase of 6,938 of total new cases treated, 248 more in-patients and 6,690 more out-patients.

15. This increase does not mean that the amount of sickness was greater, but that an increasing number of people appreciate the benefits of European medicine.

16. An even more satisfactory feature is the large increase (30,091) in the number of subsequent attendances. It is always difficult to persuade patients to continue treatment after the first symptoms have subsided and that the difficulty is being overcome shows an increasing faith in treatment, the result not of hearsay but of personal experience of the benefits to be obtained.

17. Sierra Leone was free from any epidemics throughout the year.

COMMUNICABLE DISEASES.

18. *Dysentery*.—A total number of 475 cases, showing an increase of 175. These figures need not be taken too seriously, as a very large proportion of the total number is returned from out-station dispensaries where the diagnosis is made by the dispenser on clinical symptoms only.

19. *Tuberculosis*.—The number of cases treated shows a slight decrease, but there can be no doubt that this disease is becoming increasingly prevalent. The increase in the number of sub-acute cases points to the fact that the disease is becoming established here. A departmental committee has been appointed to consider what steps can be taken for the control and treatment of the disease. Meanwhile, in the case of Freetown, the Registrar of Births and Deaths informs the Medical Officer of Health of all deaths returned as due to tuberculosis; the premises are then inspected and disinfected and advice given re overcrowding, etc.

20. *Venereal Diseases*.—Both gonorrhœa and syphilis show a considerable increase in the number of cases presenting themselves for treatment, but this probably indicates a greater faith in modern treatment rather than an actual increase in the incidence of the disease.

21. Table of Incidence.

Disease.				1920.	1921.	1922.	1923.	1924.
Tuberculosis	...	...	...	65	116	91	138	131
Dysentery	...	...	...	404	185	252	306	481
Gonorrhœa	...	...	...	1,143	1,087	969	1,126	1,248
Syphilis	...	...	...	472	687	647	723	919

22. *Malaria*.—There is a small increase of 457 in the number of cases treated—3,492 against 3,035 for 1923. The deaths from malaria were twelve or a case mortality of 34 per cent.

23. *Blackwater Fever*.—There were seven cases during the year with one death.

24. *Trypanosomiasis*.—Two cases only were reported.

25. *Leprosy*.—Twenty-five new cases were reported during the year. Of these only five could be persuaded to submit to any treatment and all these five absconded after only one injection of Moogrol or Gorli seed oil. One nodular case remaining from 1923 continued to do well on Moogrol.

26. *Ankylostomiasis*.—This invasion is general throughout the Colony and Protectorate. Each medical officer submits an annual special report on this disease. The following table gives the numbers examined with the percentage of infection.

Place.	Number Examined.	Number Infected by Ankylostomes.	Per Cent.	Remarks.
Freetown	503	93	18.48	Hospital laboratory
"	552	92	16.6	Freetown prisons, including 179 re-examinations
Bonthe	141	99	70.21	In and out-patients and prisoners; very few showed symptoms
Kissy	229	69	30	Patients, male and female infirmaries
Bo	138	67	48.55	Bo School and Kennema prison
Daru	100	61	61	Soldiers and other natives
Port Lokko	23	7	30.43	Court messengers
Moyamba	148	110	74.32	Moyamba prison, court messengers, warders and some of their wives and children
Makeni	206	62	31	Practically all soldiers and messengers

(ii) EUROPEAN OFFICIALS (EXCLUDING IMPERIAL FORCES).

27. Table showing the sick, invalidings and death-rates of European officials:—

	1922.	1923.	1924.
Total number of officials resident	209	188	198
Average number resident	109	102	164
Total number on sick list	159	167	155
Total number of days on sick list	1,426	1,462	1,382
Average daily number on sick list	3.90	4.00	3.77
Percentage of daily sick to average number of residents	3.57	3.92	2.29
Average number of days on sick list to each patient ...	8.96	8.75	8.91
Average sick time to each resident	13.08	14.33	8.42
Total number invalided	5	14	13
Percentage of invalidings to total residents	2.39	7.44	6.56
Percentage of invalidings to average number resident	4.58	13.72	7.92
Total deaths	2	...	1
Percentage of deaths to total residents	0.95	...	0.50
Percentage of deaths to average number resident ...	1.83	...	0.60

28. Causes of invalidings and death of European officials.

Causes.	Invalided.	Died.
Malaria	2	
Malaria and neurasthenia	1	
Dysentery	1	
Jaundice	1	
Ulceration of stomach	1	
Neurasthenia	1	
Pulmonary tubercnlosis	2	
Blackwater fever	1	1
Cardiac insufficiency	1	
Cardiac affection	1	
Pneumonia	1	
Total	13	1

(iii) AFRICAN OFFICIALS.

29. Table showing the sick, invalidings and death-rates of African officials:—

	1922.	1923.	1924.
Total number of officials resident	850	850	992
Average number resident	750	750	900
Total number on sick list	1,071	879	1,009
Total number of days on sick list	7,887	7,586	8,920
Average daily number on sick list	21.60	20.78	24.37
Percentage of daily sick to average number resident ...	2.88	2.77	2.70
Average number of days on sick list to each patient ...	7.36	8.63	8.84
Average sick time to each resident	10.38	10.11	9.91
Total number invalided	7	13	18
Percentage of invalidings to total resident	0.82	1.52	1.81
Percentage of invalidings to average number resident	0.93	1.73	2.00
Total deaths	6	7	5
Percentage of deaths to total residents	0.70	0.82	.50
Percentage of deaths to average number resident ...	0.80	0.93	.55

30. Causes of invalidings and deaths of African officials:—

Causes.							Invalided.	Died.
Urinary calculus	...	...	...	...	...	...	1	
Pulmonary tuberculosis	...	...	...	...	...	...	3	
Valvular disease of the heart with hypertrophy	...	...	...	...	...	...	2	
Mental instability and general debility	...	...	...	...	...	...	1	
Malignant cervical adenitis	...	...	...	...	...	...	1	
Mental instability	...	...	...	...	...	...	1	
Enlarged spleen, chronic œdema of the leg and deafness	...	...	...	...	...	...	1	
Hypermetropia and chronic nephritis	...	...	...	...	...	...	1	
Intermittent tachycardia	...	...	...	...	...	...	1	
Elephantiasis of the scrotum and left foot	...	...	...	...	...	...	1	
Endocarditis, bilateral hypermetropia and incipient cataract	...	...	...	...	...	...	1	
Chronic Rheumatism	...	...	...	...	...	...	1	
Hallucinations with suicidal tendencies	...	...	...	...	...	...	1	
Delusional insanity	...	...	...	...	...	...	1	
Uterine fibroids (female official)	...	...	...	...	...	...	1	
Chronic malaria and bronchitis	...	...	...	...	...	...	...	1
Cardiac affection	...	...	...	...	...	...	...	2
Chronic malaria	...	...	...	...	...	...	...	1
Stricture of the urethra	...	...	...	...	...	...	...	1
							18	5

(iv) HEALTH OF TROOPS.

(a) IMPERIAL TROOPS—EUROPEAN.

31. Table showing the average strength, admission into hospital, number of cases placed on sick list for barrack treatment, numbers invalided and deaths, with ratios per 1,000 of the strength:—

AVERAGE STRENGTH 42. DISEASES.	Admissions into Hospital.	Invalids sent Home.	Deaths.	RATIO PER 1,000.		Deaths.	BARRACK TREATMENT.	
				Admis- sions.	Invalids sent Home.		Placed on Sick List.	Ratio per 1,000.
<i>Specific Diseases due to Infection :</i>								
Enteric fever (inclusive of Typhoid para. A, B and C and enteric group ...	...	1	...	...	23·81	...	...	...
Malaria	10	1	...	238·9	23·81	...	12	285·71
<i>Other Diseases classified under Systems :</i>								
Diseases of the nervous system	1	1	...	23·81	23·81	...	...	...
Diseases of the respiratory system :								
Bronchitis and bronchioles	1	...	...	23·81	...	...	1	23·81
Digestive system, other diseases ... ..	...	...	...	...	...	...	1	23·81
Areolar tissue	1	...	...	23·81	...	...	...	...
General injuries ... ..	...	...	...	...	...	...	...	...
Local injuries	2	...	...	47·62	...	...	1	23·81
Total	15	3	...	357·14	71·43	...	15	357·41

IMPERIAL TROOPS (EUROPEAN), WARRANT OFFICERS,
NON-COMMISSIONED OFFICERS AND MEN.

32. Tables showing the average strength, admission in hospital, number of cases placed on the sick list for barrack treatment, number invalided and deaths, with the ratio per 1,000 of the strength.

AVERAGE STRENGTH, 236.			Admissions into Hospital.	Invalids sent Home.	Deaths.	RATIO PER 1,000		Deaths.	BARRACK TREAT- MENT.	
DISEASES.						Admis- sions.	Invalids.		Placed on Sick List.	Ratio per 1,000.
<i>Specific Diseases due to Infection :</i>										
Influenza	...	...	8	...	...	33.89	...	...	12	50.9
Malaria	...	...	94	2	1	398.3	8.46	4.24	17	72.64
<i>Venereal Diseases :</i>										
Gonorrhœa	...	...	21	...	...	88.9	...	...	...	...
Soft chancre	...	...	2	...	...	8.46	...	...	...	...
Syphilis	...	...	6	...	...	25.4	...	...	...	...
<i>Other Diseases classified under Systems :</i>										
Diseases of the nervous system	...	...	2	...	...	8.45	...	...	5	21.5
Diseases of the eye	...	...	2	...	...	8.46	...	...	3	12.7
Diseases of the ear and nose	...	...	5	...	...	21.5	...	...	25	106.0
Circulatory system	...	...	...	...	...	...	...	...	...	...
D. A. H.	...	...	1	1	...	4.24	4.24	...	...	...
Blood	...	...	11	1	...	46.3	4.24	...	9	38.15
Spleen	...	...	...	1	...	...	4.24	...	...	...
Lymphatic system	...	...	6	...	...	25.4	..	...	...	...
<i>Respiratory System :</i>										
Bronchi and bronchioles	...	...	6	...	...	25.4	...	...	3	12.7
Teeth and gums	...	...	...	...	...	...	...	...	16	67.8
<i>Digestive System :</i>										
Inflammation of tonsils	...	...	2	...	...	8.46	...	...	1	4.24
Other diseases	...	...	14	1	...	59.3	4.24	...	15	63.24
Generative system	...	...	7	...	...	29.6	...	...	...	...
Organs of locomotion	...	...	12	...	...	50.9	...	...	15	63.24
Areolar tissue	...	...	18	...	...	77.3	...	...	28	118.60
Skin—scabies	...	...	1	...	...	4.24	...	...	...	...
other diseases	...	...	3	...	...	12.7	...	...	48	203.39
Injuries—general	...	...	2	...	...	8.46	...	...	4	16.94
local	...	...	16	...	...	67.8	...	...	47	199.15
Poison	...	...	23	...	...	97.0	...	...	...	...
Parasites—animal	...	...	...	...	...	...	...	...	1	4.24
vegetable	...	...	...	...	...	...	...	...	...	...
No appreciable disease	...	...	1	...	...	4.24	...	...	...	...
All other causes	...	...	...	...	...	...	...	...	24	101.6
Total	...	...	263	6	1	1,114.41	25.42	4.24	273	1,156.78

33. Imperial troops (European):—

Average strength	278
Total number on sick list	566
Percentage of sick to average number on sick list <i>Strength</i>	203.9
Total number invalided	9
Percentage of invalidings to average number resident	3.5
Total number of deaths	1
Percentage of deaths to average number resident	36

(b) IMPERIAL TROOPS—NON-EUROPEAN (WEST AFRICAN REGIMENT).

34. Table showing the average strength, admission in hospital, number of cases placed on the sick list for barrack treatment, number invalided and deaths, with the ratio per 1,000 of the strength.

AVERAGE STRENGTH, 443. DISEASES.			Admission into Hospital.	Invalids Finally Discharged.	Deaths.	RATIO PER 1,000.		Deaths.	BARRACK TREAT MENT.	
						Admis- sions.	Invalids.		Placed on Sick List.	Ratio per 1,000.
<i>Specific Diseases due to Infection:</i>										
Dysentery	...	...	1	...	...	2.25	...	...	...	...
Malaria	...	...	42	...	2	96.00	...	4.51	22	49.00
<i>Venereal Diseases:</i>										
Gonorrhœa	...	...	28	1	...	64.16	2.26	...	1	2.25
Soft chancre	...	...	4	...	...	9.0	...	...	4	9.00
Syphilis...	...	...	1	...	...	2.25	...	...	...	...
<i>Other Diseases classified under Systems:</i>										
Mental diseases	...	...	1	...	...	2.25	...	...	1	2.25
Nervous diseases	...	...	2	...	...	4.5	...	...	...	...
Diseases of the eye	...	...	3	3	...	6.77	6.77	...	1	2.25
Diseases of the ear and nose	...	...	1	...	...	2.25	...	...	2	4.5
<i>Circulatory System:</i>										
Valvular diseases of the heart	...	...	1	...	1	2.25	...	2.25	...	...
Blood	...	...	2	...	...	4.5	...	...	1	2.25
Lymphatic system	...	...	10	...	...	22.1	...	...	...	...
<i>Respiratory System:</i>										
Other diseases	...	...	1	...	...	2.25	...	...	15	33.8
Bronchi and Bronchicles	...	...	11	...	...	24.2	...	...	...	...
Larynx and trachœa	...	...	1	...	...	2.25	...	...	...	...
Diseases of the teeth and gums	...	...	1	...	...	2.25	...	...	2	4.5
<i>Digestive System:</i>										
Inflammation of tonsils	...	...	1	...	...	2.25	...	...	1	2.25
Other diseases	...	...	15	1	...	33.8	2.26	...	10	22.1
Diseases of the generative system	...	...	4	...	...	9.0	...	...	3	6.77
Organs of locomotion	...	...	11	3	...	24.2	6.77	...	23	51.03
Areolar tissue	...	...	45	...	...	101.8	...	...	6	11.15
Skin—other diseases	...	...	3	...	...	6.77	...	...	...	...
Urinary system	...	...	2	...	...	4.5	...	...	61	139.30
Injuries—local	...	...	5	...	...	11.1	...	...	...	...
Tumours and cysts	...	...	1	...	...	2.25	...	...	...	...
Injuries—general	...	...	...	...	...	...	...	...	1	2.25
All other causes	...	...	...	...	...	...	...	...	28	64.16
No appreciable disease	...	...	...	...	...	...	...	...	1	2.25
Total			197	8	3	444.90	18.06	6.77	183	411.06

WEST AFRICAN FRONTIER FORCE (AFRICAN).

35. The following table gives the sick and death-rates:—

Average Strength of Battalion in 1924.	Total Number of Deaths.	Death-rate per 1,000.	Total Number of Men on Sick List.	Sick Rate per 1,000.
343	1	2.91	751	2,189

(v) POLICE.

36. The following table gives the sick and death-rates:—

Total Number of Men.	Total Number of Deaths.	Death-rate per 1,000.	Total Number of Men on Sick List.	Sick Rate per 1,000.
303	3	9.90	1,057	3,488

(vi) HILL STATION EUROPEAN RESERVATION.

37. Between 700 and 900 feet above Freetown, overlooking it and connected with it by a winding railway about five miles long and a good motor road.

The average number of residents at Hill Station during the year was fifty-four, divided as follows:—

Civil officials	...	...	...	...	...	34
Military	...	...	...	...	...	7
Missionaries	...	...	...	...	...	2
Non-officials and wives of above	...	...	...	...	...	11

38. General table of invalidings and deaths of Europeans.

In the following table the figure for "others" under total residents is taken from the last census with slight amendment and therefore only approximate:—

	Total Resident.	Deaths.	Invalided.
Officials, including West African Frontier Force	198	1	13
Imperial Military	300	1	9
Others	430	7	Not available

(vii) PRISONERS.

39. Table showing sick and death-rates in Freetown Prison:—

	1922.	1923.	1924.
Total number of prisoners admitted	1,116	1,040	1,190
Average strength	276	248	259
Total deaths	12	3	10
Total number of prisoners on sick list	290	279	188
Daily average number on sick list	28	15	9
Sick rate per 1,000 of average strength	101.4	60.48	23.16
Death-rate per 1,000 of average strength	43.3	12.09	38.61

In the Appendices will be found the following, dealing with Freetown Prison:—

- (a) Laboratory report by Dr. Dimock, Medical Officer in Charge of Laboratory.
- (b) Annual report with statistical report on Freetown Prison for 1924, by Dr. J. Y. Wood, Acting Senior Medical Officer.

40. Table showing sick and death-rates at all prisons:—

Prison.	Daily Average Number in Custody in 1924.	Sick Rate per 1,000 of Average Strength.	Death-rate per 1,000 of Average Strength.
Freetown	259	23·16	38·61
Batikanu	25	3·6	
Kaballa	11	10·00	
Moyamba	30	66·66	
Kennema	58	1·34	
Pujehun	38	·52	

III—HOSPITALS AND DISPENSARIES.

CONNAUGHT HOSPITAL.

41. The capacity of the Connaught Hospital remained the same as before, eighty beds and five cots.

42. The old law courts continued to be used as administrative offices, stores, laboratory, dispensary and out-patients departments.

43. A new mortuary was built in the hospital grounds.

As there was no immediate prospect of electric light being installed in Freetown, the building formerly used by the Dentist and earmarked for X-Rays and electric plant was converted into a venereal diseases clinic.

44. The total number of admissions during the year was 1,862 with 129 deaths. In 1923, the total number of admissions was 1,577 with 121 deaths. The prevailing diseases were bronchitis, pneumonia, malaria, abscess, ulcers, intestinal parasites and injuries.

45. The total in-patients and the maternity in-patients since 1904 are shown in the following table:—

Year.	Total In-patients.	Maternity In-patients.	Remarks.
1904	1,098	61	
1905	1,358	74	
1906	1,170	46	
1907	1,051	60	
1908	949	57	
1909	1,214	97	
1910	1,447	117	
1911	1,481	125	
1912	1,645	191	
1913	1,465	63	
1914	1,387	?	
1915	1,136	?	
1916	1,096	109	
1917	1,664	105	
1918	1,493	?	
1919	1,477	93 ?	
1920	602	133	{ Hospital burnt—temporary hospital of one male ward and four maternity beds.
1921	737	142	{ New hospital opened—four wards in January, including maternity ward of eleven beds. Two more wards in August.
1922	1,282	169	
1923	1,557	200	
1924	1,862	263	

46. Dr. E. J. Wright, Medical Officer in charge of the Maternity Ward, furnishes a comprehensive report which appears as Appendix II, page 53.

47. There were no cases of *ophthalmia neonatorum* during the year.

48. A very bad case of *teatnus neonatorum* recovered after treatment. Notes thereon will be found in the routine report, Appendix II, page 57.

49. Out-patients cases during the last five years have been as follows:—

	1920.	1921.	1922.	1923.	1924.
New cases	8,152	5,654	10,573	11,335	10,955
Subsequent attendances	13,270	16,209	10,443	36,985	38,475
Total	21,422	21,863	21,016	48,320	49,430

50. The Nursing Home (European hospital) remained in the same building as mentioned in the report for 1923 up to the end of December when it was removed to Governor's Lodge, Hill Station.

51. The total number of patients was 150 with two deaths, as against 131 and two deaths in 1923 and 126 and seven deaths in 1922.

52. Two major and ten minor operations were performed during the year.

53. The number and status of those who received treatment as in-patients in the institution were as follows:—

	Admissions.	Deaths.
(a) Government officials	50	...
(b) Shipping	73	...
(c) Mercantile	16	1
(d) Miscellaneous	3	1
(e) Ladies	4	...
(f) Naval	1	...
Total	147	2

(This excludes three cases brought over from 1923.)

KISSY INSTITUTIONS.

54. The total number of cases treated at Kissy and Wellington dispensaries was 6,370.

55. Other statistics for Kissy Institutions are as follows:—

	Admissions.	Total treated.	Died.
Lunatic Asylum	43	144	14
Infirmaries	47	315	62

56. Hospitals and dispensaries in the Colony and Protectorate remain the same as last year.

57. At Bonthe a new hospital is in course of erection. Pujehun was reopened as a medical officer's station.

HOSPITAL AND DISPENSARY STATISTICS.

58. Table showing total number of new cases treated at hospitals and dispensaries for twenty years, 1905 to 1924.

Years ...	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.
Patients ...	31,211	32,635	33,027	38,468	33,401	36,052	39,405	41,946	31,536	49,419
Years ...	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.
Patients ...	50,513	49,368	57,765	55,562	44,698	51,287	48,270	51,689	50,260	53,270

59. During the year under review, quinine was issued gratuitously to the public to the extent of 271,185 grains for the prophylaxis of malaria. This shows an increase of 31, 939 grains, as compared with 1923 when 239,246 grains were issued.

IV—SCIENTIFIC.

60. Reports appear as Appendices.

W. D. INNESS,

Director of Medical and Sanitary Services.

V—SANITATION.

ADMINISTRATION.

Owing to the fact that Dr. O'Hara May was acting as Director of Medical and Sanitary Services for the first eight months of the year and was subsequently absent on leave, Major Peacock, Senior Sanitary Officer, acted as Deputy Director of Sanitary Service for practically the whole of the year. In the absence on leave of Dr. J. M. MacKay, M.C., Dr. W. A. A. Malone acted as Medical Officer of Health for ten months of the year. Complete details as to leave and resumption of duty will be found in another place.

2. It is now generally agreed that a joint Medical and Sanitary Office is not a success, and it is hoped that when funds permit, new offices will be built to house the Sanitary officers and Medical Officer of Health, Freetown.

3. The establishment of sanitary inspectors was kept practically up to full strength during the year. At the end of the year there were twenty fifth grade inspectors and nine learners. Great difficulty is still experienced in getting a sufficient supply of suitable recruits for the Sanitary Service. The educated Sierra Leonean for the most part prefers a sedentary life and is therefore more inclined to enter the clerical service than the sanitary in which the work is largely outdoor and somewhat strenuous. The scale of salaries in each of these services is practically the same.

There were six ex-Bo school boys on the staff at the end of the year.

4. During the year sanitary inspectors were posted for the first time to Pujehun, Waterloo and Makeni. There are now eight inspectors employed outside Freetown. A Mende ex-Bo school boy is working amongst his own tribe at Daru and Pendembu.

5. Dr. O'Hara May inspected the following places during the year:—Kanre Lahun, Pendembu, Daru, Kennema, Panguma, Gerihun, Bo and Njala. Major Peacock inspected Bonthe, York Island and Makeni.

6. The total cost of the Sanitary Department during the year was distributed as follows:—

					£	s.	d.
Salaries, allowances and travelling ...	...	...	...	...	7,941	16	3
Labour ...	...	...	...	...	7,530	9	7
Materials and maintenance ...	...	...	...	...	89	12	4
Rent of buildings ...	...	...	...	...	295	2	3
Library and scientific apparatus ...	...	...	...	...	43	14	10
Meteorology ...	...	...	...	...	36	12	0
Miscellaneous ...	...	...	...	...	18	13	1

7. Ratio of Medical and Sanitary to total estimated revenue during the last five years.

Year.					Medical Vote.	Sanitary Vote.	Ratio of Medical and Sanitary Vote to Estimated Revenue.
					£	£	
1924	...	...	...	...	48,416	19,309	1 : 10·6
1923	...	...	...	...	46,658	21,375	1 : 11·1
1922	...	...	...	...	51,164	24,106	1 : 11
1921	...	...	...	...	57,642	25,252	1 : 12·4
1920	...	...	...	...	31,606	15,878	1 : 10·7

(b) LEGISLATION.

8. Section 44 of the Public Health Ordinance, 1905, was amended in order to empower a coroner to grant permission to hold a post-mortem examination where a medical officer considers that there is reason to suspect that any person has died of a notifiable infectious disease. This is of particular importance in connection with yellow fever and plague.

9. By Order in Council, Rotifunk, Sembahun, Gerihun and Yonni Banna were declared sanitary districts under the Public Health (Protectorate) Ordinance, 1915, and rules were subsequently applied to each of these places. A rule enabling action to control domestic mosquito breeding places was applied to Blama, Kennema, Segbwema and Pendembu.

10. By Order in Council No. 13 of 1924 the keeping of swine at York Island was prohibited.

11. The following table shows the places which were declared infected under the Quarantine Ordinance, 1914, and subsequently declared free from infection with dates and diseases on account of which action was necessary:—

Place.	Country.	Disease.	Infected, 1924.	Free, 1924.
Seccondee ...	Gold Coast ...	Plague	17th March	9th May
Porto Novo ...	Dahomey ...	Yellow fever	8th May	5th July
Coomassie ...	Gold Coast ...	Plague	9th May	6th June
Coomassie ...	Gold Coast ...	..	26th June	23rd September
Seccondee ...	Gold Coast ...	..	8th July	9th August
Lagos ...	Nigeria ...	..	27th August	...
Koforidua ...	Gold Coast ...	Yellow fever	7th November	19th December
Coomassie ...	Gold Coast ...	Plague	22nd November	...

II—(a) PREVENTIVE MEASURES AGAINST INSECT-BORNE DISEASES.

MALARIA.

12. The following is taken from the report of Dr. J. M. MacKay, M.C., Medical Officer of Health, Freetown:—

“(a) *House to House Inspection*.—100,656 inspections of houses and compounds were carried out during the year, 353 mosquito breeding places being found. 353 prosecutions followed with 314 convictions. Total fines amounted to £77 10s., an average fine of 4s. 11d. per case.

“(b) *Mosquito Breeding Places*.—The total number of mosquito breeding places discovered and dealt with was 796.

“(c) *Mosquito Larvæ Index*.—A mosquito larvæ index was taken at the end of:—

1st Quarter	...	...	...	14 per cent.
2nd ..	...	...	...	None available.
3rd ..	...	...	...	3.56 per cent. (1.78 per cent. excluding larvæ found in rock pools.)
4th ..	...	...	...	1.43 per cent.

“(d) *Closing of Wells*.—One well, the existence of which was only discovered during 1924, was closed by the Public Works Department.

“(e) *Cesspools*.—Disinfection of cesspools was carried out during the dry season and 11,057 cesspools were oiled during the rains.

“(f) *Canalization of Streams*.—Alligator, Sanders and Nicoll's brooks were regulated and canalized towards the end of the year and all mosquito breeding pools, etc., were obliterated.

“(g) *Oiling of Pools and Gutters*.—79,886 pools and gutters were oiled by inspectors in charge of sections and 31,708 by the oiling gang, which operated for six months of the year. Total 111,594.

“(h) *Inspection of Trees*.—32,440 trees were inspected during the year and 20,495 holes likely to hold water were discovered. 13,372 of these holes were cemented and 7,123 were cut so as to prevent water lodging there. 319 mosquito breeding places were found.

“(i) *Inspection of Boats and Canoes*.—6,547 boats and canoes were inspected for stagnant water and 2,159 were oiled.

“(j) *Drainage*.—The following drainage work was carried out by the Sanitary Engineer:—

(i) *New Concrete Drains*.—Outfall, Oxford Street to Kru Bay

Extension of culvert drain across Pademba Road at junction with Wellington Street

Westmoreland Street to King Jimmy obliterating underground drain

Drain in Garrison Street

Drain in Pultney Street

Sanders Street—outfall to Alligator Brook

The drainage of Easton Street, Malta Street, Bethel Street and collecting drain in Fourah Bay Road taken in hand.

(ii) *Improvements to existing Drains*.—Kissy Road, Phillip Street, Dillet Street, Benjamin Lane, Peter Lane, Upper Savage Square, Circular Road, Walpole Street, Fourah Bay Road, Pademba Road, Westmoreland Street, Campbell Street, Water Street, Wilberforce Street, Third Street, Fourth Street, Foulah Street, Lower Savage Square, culvert at junction of Oxford Street and Percival Street, culvert at junction of Charlotte Street, Oxford Street, George Street and Oxford Street, Mends Street.

13. Attached (a) is a graph by Mr. Herd, showing the monthly variation in larvæ breeding places, the monthly rainfall and the average monthly rainfall for the period forty years combined.

(b) An account of the investigation of oil-palms for larvæ by Mr. Herd:—

“Seventy-two palms were systematically examined during the period 25th August to 5th September.”

Figures for the full period are as follows:—

Number of palms examined	...	...	...	...	72
„ containing water	...	...	...	...	28
„ in which larvæ were found	...	...	...	...	14
Percentage of palms with holes containing water	...	...	...	...	38·8 per cent.
„ in which larvæ were found	...	...	...	...	19·4 „
„ containing water in which larvæ were found	...	...	...	...	50 „
Greatest depth of water	...	...	...	...	24 inches

TYPES OF LARVÆ:—

Culex	...	...	...	...	...	...	5
Stegomyia	...	...	...	...	...	...	9

14. In the Protectorate—in all Government stations and sanitary districts—routine anti-malaria work was carried on, no matter of special interest was reported. Prison labour is employed where available. £7,530 9s. 7d. was spent on sanitary labour distributed as follows:—

							£	s.	d.
Freetown	...	...	...	...	...	...	4,405	5	6
Wilberforce and Murray Town and Cape	...	...	...	...	...	...	280	1	3
Hill Station	...	...	...	...	...	...	711	6	7
Bonthe and York Island	...	...	...	...	...	...	529	1	9
Waterloo	...	...	...	...	...	...	49	18	0
Sixteen Protectorate towns and Government stations in amounts varying from £17 to £164	...	...	...	...	...	...	1,554	16	6
Total	...	...	...	...	...	...	£7,530	9	7

YELLOW FEVER.

15. None reported during the year.

TRYPANOSOMIASIS.

16. Two cases were seen; clinically they were typical of the disease, but in neither case was the trypanosome found nor was a post-mortem obtained.

Herewith is a report of each case from the medical officer in charge:—

- (i) The case (*f*) was admitted to the wards from out-patients, the diagnosis was clinical and not confirmed by the laboratory. The relatives gave a history of several months fever and drowsiness.

The patient presented a typical picture of late trypanosomiasis, there was evidence that there had been extensive cervical adenitis and a good amount of scarring, the result of native treatment. Extreme lethargy and nervous tremors completed the picture.

- (ii) Patient admitted to the male infirmary on 4th July, sent from Freetown with a provisional diagnosis of trypanosome infection. There were enlarged glands in the neck and he was wont to go off to sleep at all times. The blood examined on several occasions, but no trypanosomes were seen. The glands were not punctured. He had a history of having been in the Congo.

17. During the year further work was done by prison labour at Cape Sanitary Station, a further extent was cleared and planted with Efwatakala grass. At the end of the year more than half the peninsula was completely cleared, and half this cleared area well planted.

RELAPSING FEVER.

18. No case was reported during the year. All medical officers in out-stations had special instructions to be on the look out for cases, owing to the outbreak in Nigeria, Gold Coast and French territory: special endeavours to find cases in Freetown gave no results.

(b) PREVENTIVE MEASURES AGAINST INFECTIOUS AND EPIDEMIC DISEASES.

CEREBO-SPINAL MENINGITIS, INFLUENZA.

No cases of cerebro-spinal fever or influenza were reported.

PLAGUE.

20. No cases were found during the year. 12,708 rats were brought to the department and destroyed; these were paid for at the rate of 1*d.* per head. A systematic examination of rats for *B. pestis* was commenced at the end of November at the laboratory of the Medical Department. No infected rats were found.

It will be seen from the list of places infected with plague during the year that from March till end of the year the Gold Coast was infected and, for the last four months of the year, Lagos. We are in direct and constant sea communication with these places and, moreover, practically all deck-hands of these ships are recruited and discharged in Freetown. This entailed rigid supervision of every homeward bound ship calling here, quarantining all deck-hands and deck passengers who had been in an infected port within the specified time and disinfection of their belongings. The Sanitary Departments of the Gold Coast and Nigeria are to be congratulated on the excellent preventive measures adopted and so effectively carried out.

Towards the end of the year, Dr. Peacock was sent to Lagos and the Gold Coast to study these methods, and returned in January with valuable information and suggestions for combating the disease should it occur.

SMALLPOX, CHICKEN-POX, VACCINATION.

21. Sierra Leone was unusually free from smallpox during the year. Two suspicious cases were diagnosed as doubtful and treated as smallpox in the Infectious Diseases Hospital. In the Protectorate ten cases were notified, one at Kumrabai Mamilla (Bombali District), six in the Imperri chiefdoms (Gbangbama District) and three at Kaiyima (Konno District). Chicken-pox was frequently reported in various parts of the Colony and Protectorate.

Record of vaccinations performed:—

	1924.	1923.	1922.
Number vaccinated	9,636	21,517	26,448
.. successful	4,925	10,294	9,795
.. unsuccessful	2,052	4,266	6,302
.. not inspected	2,659	6,957	10,351

Owing to the abolition of specially appointed vaccinators in the Protectorate, the number of vaccinations during the last two years shows an apparent falling off. Vaccination is now being carried out more efficiently and under close supervision by sanitary inspectors and dispensers, and every effort is being made to increase the amount done.

DYSENTERY.

22. According to the reports from the Connaught Hospital there would appear to be a great apparent reduction:—

Year.	Cases.
1922	127
1923	138
1924	42

In this connection, the Acting Senior Medical Officer says:—"Practically speaking this disease is now negligible in Freetown."

TUBERCULOSIS.

23. It is the general opinion that tuberculosis is very noticeably on the increase in the Colony. Towards the end of the year a committee was formed to report on the prevalence, spread, etc., and to suggest means of dealing with same, to report, *inter alia*, on the advisability of rendering it a notifiable disease. Up to the end of the year the report was unfinished.

The number of cases treated is seen in the medical part of this report.

ANTHRAX.

24. There were four cases of anthrax in animals discovered during the year, diagnosis being confirmed by bacteriological examination. No human cases were found.

MEASLES.

25. Two cases of measles were admitted to the Infectious Diseases Hospital during the year.

OTHER DISEASES.

26. Diphtheria was not seen during the year. Sporadic cases of whooping cough were seen, no epidemic was reported.

(c) PORT SANITARY WORK, FREETOWN.

27. The port was not in quarantine during the year. All ships arriving from infected places were examined by the Medical Officer of Health and, when necessary, action taken.

Owing to the numerous places infected with plague, etc., the port sanitary work was greatly increased; the crew and deck passengers of all ships coming from a plague infected port were individually examined. This entailed an amount of extra work on the Medical Officer of Health, who is also port medical officer, and on several occasions his whole day was spent on port work.

In Freetown the ships anchor in the river at various distances from the bank, and although there is no surf condition as is experienced further down the coast, yet when the weather is rough and the current is strong it has taken forty minutes to one hour to get along side a ship lying far out. Sometimes the only means of getting on board or leaving the ship is by climbing a rope ladder—no pleasant matter during torrential rains, high wind, and with a six knot current running. The Medical Officer of Health has been known to have been completely ducked in the river, and I have several times seen his clothes ruined with grease, tar and oil. Once I had a request that the department should buy him a new suit. Outside the department it is not realized what an unpleasant, arduous and often dangerous job ship boarding is here.

The provision of a motor-boat for the port medical officer, is absolutely essential unless the question of appointing another officer for this work other than the Medical Officer of Health is considered.

III—GENERAL MEASURES.

A—GENERAL SANITARY WORK.

(a) *Sanitary Inspections*.—9,206 notices to remove insanitary conditions on premises were served. Eighty-seven persons were summoned for non-compliance and forty-three were fined, the fines amounting to £8 8s.

(b) *Meat Inspection*.—3,351 bullocks, 255 sheep, twenty-three goats and five pigs were slaughtered in the public slaughterhouse for public sale. 583 bullocks, 124 sheep and two goats were slaughtered in the Imperial slaughterhouse for the Imperial Government, seven bullocks and ten quarters of beef were condemned as unfit for human consumption and destroyed by order of the Police Magistrate for *Cysticercus bovis*. Four bullocks infected with anthrax were destroyed. One liver infected with flukes was destroyed.

(c) *Food Inspection*.—The following food-stuffs were condemned and destroyed:—

91	Lb. sausages
106	Tins assorted provisions
40	Barrels pork
79	Tins macaroni and vermicelli
7	Tins chicken
1	Tin mackerel
1	Tin veal
9	Tins black pudding
1	Tin pork and beans
7	Tins pilchards
13	Tins beef
2	Tins force meat
5	Tins liver paste
1	Tin butter
8	Cases ocean herrings
66	Tins ocean herrings
32	Tins sausages
3	Tins beans.

SANITARY BUILDINGS.

- (a) Repairs to chutes at Falcon Bridge and Rawdon Street.
- (b) Repairs to incinerators at Bombay Street and Easton Street.
- (c) Repairs to latrine at Mountain Cut.
- (d) Construction of new refuse bin at John Lane.

B—WATERWORKS.

The following report is submitted by Mr. Wilfred S. Cole, the Superintendent of Waterworks:—

“The works were maintained during the year in a high state of efficiency and determined steps were taken to reduce, as far as possible, all avoidable waste of water. The water authority now undertakes free of cost minor repairs to water services, such as the rewashering of taps, etc., and private consumers are invited to report at once all defects in their services to this department.”

NEW WORKS.

“The following new works were executed during the year:—

“(a) 324 yards of C.I. distributing mains were laid along Pademba Road from its junction with Fergusson Street on towards its western end. Three fire hydrants were fixed on this length of main, making a total of 324 fire hydrants now in the city.

“(b) Twenty new private services were laid during the year. There are at present 420 private services in addition to Government and Municipal services.

“(c) Two new public standposts were erected during the year—one at Andrew Street, and the other at junction of Bolling Street and Campbell Lane, King Tom. The total number of public standposts is at present 216.

“(d) About 225 yards of 3 inches C.I. piping which had been temporarily laid to convey the dry weather flow from the supplementary dam at the Malamah Extension to the pool at the pumping station were replaced with 3 inches galvanized wrought iron piping imported during the year for this purpose.

LOWERING OF DISTRIBUTING MAIN.

“ The 6 inches C.I. distributing main at Patton Street, which was originally laid too near the surface of the street owing to the rocky nature of the soil, was lowered during the year to an average depth of 2 feet 6 inches below the street level.

“ The mains at the junction of Kissy Street, Regent Road, Garrison Street and Wilberforce Street were also lowered below the lowest point of the new concrete outfall laid during the year along Garrison Street by the Public Works Department.

PROPOSED WATER SUPPLY FROM WAR DEPARTMENT FOR BERRY STREET (CENTRAL).

“ During the year negotiations were carried on between the Water Authority and the Military Authorities to supply the area about Berry Street, Central, with water from the War Department mains. This portion of the town is situated at too great an altitude to be supplied with water from the service reservoir at Tower Hill. It is hoped that at no distant date a 3 inches main with three 2½ inches fire hydrants and two public standposts will serve this locality.

CONSUMPTION.

“ The total consumption of water in the city for all purposes during the year was 155,744,000 gallons, or an average daily consumption of 425,530 gallons.

“ The maximum daily consumption was 606,700 gallons on the 26th of February. This includes water used for street watering.

“ The minimum daily consumption was 299,480 gallons on the 11th of July. Whereas, both the maximum and minimum daily consumption are in excess of those for the preceding year, it is satisfactory to note that the average daily consumption shows an appreciable decrease.

“ There was no shortage of water supply during the year.”

OVERCROWDING.

29. The findings of the committee mentioned in paragraph 43 of last annual report were issued during the year, new building regulations were formulated, and it is hoped that in course of time the great overcrowding of buildings in Freetown will be remedied.

C—HILL STATION.

30. This is the residential area at the terminus of the Mountain railway. In this area there are three non-official bungalows, two army bungalows, the remainder being occupied by officials of the various Government departments. It is five and a-half miles from Freetown, varies in height from 800 to 1,000 feet above sea level.

Water Supply.—Pipe-borne from a reservoir in the hills behind, the catchment area is well protected and a recent bacterial examination showed the water quite free from pollution, nevertheless the water is in most cases boiled and filtered before use. Towards the end of the dry season, March and April, the supply has usually to be cut off for a few hours daily, this causes very little inconvenience.

Conservancy.—This includes disposal of night soil, road sweeping, house refuse; all night soil is trenched daily, all refuse is brought to the incinerator where it is picked, the incombustible material is burned in a deep pit, the rest burned in the incinerator. The bush for some fifty yards round all compounds is kept clear of weeds, etc. The annual cost of this is about £700.

Mosquito Larvæ.—In the dry season it is very exceptional to see an adult mosquito; a few are seen in the wet season, between end of April and November.

In the wet season of 1924, an intensive mosquito campaign was undertaken by Mr. Herd, when 583 samples of larvæ were taken as under:—

Trees	...	...	...	...	...	...	482
Rock pools	...	...	...	...	...	...	15
Gutters	...	...	...	...	...	...	4
Tins, bottles, etc.	...	...	...	...	...	...	82

The types of larvæ taken were:—

Anopheline	...	...	...	...	...	Nil
Stegomyia	...	...	...	...	...	216
Culeine	...	...	...	...	...	367

During the year three residents were summoned and fined under section 2 of Ordinance No. 16 of 1910.

Eighteen samples of the large jungle mosquito were taken, these larvæ were found to be carnivorous, one disposing of fifty anopheline larvæ in two days. The average number of days before pupating after taking the larvæ was sixteen.

All roof gutters were removed during the year.

D—BONTHE SANITARY REPORT.

The following is a report from the Medical Officer, Bonthe:—

STAFF. Sanitary Authority.—The medical officer and three tribal rulers, two residing in Bonthe and one in York Island. The tribal rulers were added to the sanitary authority in March, 1925.

Subordinate Staff.—Two sanitary inspectors and sanitary gang. Labourers are paid a monthly wage and are not casual, except where it is necessary to engage extra men temporarily. Prisoners are occasionally available for sanitary work.

Routine.—Routine work consists of compound inspections, clearing of dust-bins, gutters, streams, roads, latrines and Crown land. York Island is worked by a sanitary headman and labourers, and is visited twice a week by an inspector, one occasion being in the company of the medical officer.

Water.—The main supply is from shallow wells, averaging about 8 feet from ground to water. The water is apt to be very turbid in the dry season, and at this period well water is scanty and of poor quality. This supply is augmented by four concrete tanks in Bonthe, one exclusively for the hospital. York Island has one concrete tank of 16,500 gallons. The tank supply is insufficient, and two additional 20,000-gallon tanks for Bonthe and one 12,000-gallon tank for York Island have been recommended. The scarcity is felt for about six weeks from the beginning of March, but the tanks might well be opened in the middle of February, but the present supply will not permit this; in fact the tanks are opened at the last possible moment, and two and a-half to three gallons allowed to each house once a day for as long as the water lasts. There are 662 dwellings in Bonthe, and four gallons should be allowed to each house a day. This for six weeks necessitates a supply of rather over 119,000 gallons. There are in York Island 160 dwellings necessitating for the same period a supply of 28,800 gallons. Most Europeans store drinking water in their compounds in metal tanks. The tanks are cleaned out during the rains.

The Government well at York Island has been satisfactorily repaired, and a bucket and rope system instituted in place of the pump which was constantly out of order.

Latrines.—There are eight public latrines in Bonthe and two in York Island. Two in Bonthe and one in York Island are over the river; all the others are floored with concrete, with walls and roof. The walls are either of concrete or galvanized iron; the roof of galvanized iron.

There are no cesspits. Where compounds have latrines, they are provided with buckets and earth. The public latrines are provided with buckets and disinfectants and are cared for by a specialized portion of the sanitary gang. The contents are emptied either into running water or trenches at selected sites.

Street Refuse.—This is dealt with by means of public dust-bins of concrete or galvanized iron and roofed over. There are twenty-three in Bonthe and four in York Island. The contents are at present used to reclaim swamp, or fill in water-holes or unwanted wells. There are two brick incinerators with chimneys, but those are not at present in use. Individuals are liable to prosecution if caught in the act of depositing rubbish outside a dust-bin.

Drainage, etc.—There is a certain number of concrete drains, mostly in bad repair. One piece of 126 feet in length in Victoria Road has been repaired, and a report on the rest has been forwarded to the Sanitary Authorities. All drains are open. The rest of the drains are of earth, but are kept clear of weeds and canalized. Drainage in the town, however, does not offer a serious problem, owing to the porosity of the soil, except in one or two places in Claffin Lane, Tucker Street and Domboko Road. Drainage in Claffin Lane is also somewhat urgent to enable the U. B. A. Mission to efficiently drain their compound. There are one or two tidal streams in the swamps which need the attention of the sanitary gang.

A good scheme is afoot to allow individuals to fill in Heddle swamp, to the satisfaction of the medical officer, for building purposes. A nominal rent only for a certain period will be charged.

Cultivation in empty areas and areas unsuitable for building is encouraged.

Roads.—Practically all grass has now been cleared from roads and gutters by hoeing, with a great advantage from an æsthetic point of view and, it is hoped, also from a sanitary standpoint as regards cleanliness, and an anti-mosquito and anti-ankylostome measure. It should also assist in drying the surface, but eradication of grass will still take some considerable time. It may possibly in the future be necessary to sow a short grass in certain situations.

Owners and occupiers are now compelled to keep all the road and gutter adjoining their property clear to the satisfaction of the Sanitary Authority. The tribal rulers are valuable in this respect, but trouble from natives is not serious, but the same cannot be said of the educated community, though considerable headway is now being made with the latter class owing to legal action.

Heddle Road on the front is being completely laid with gravel from Mattru, adding to the appearance and also, it is hoped, as a deterrent to vegetation and land crabs.

Anti-mosquito Measures.—Compounds are constantly inspected. Probably owing to this but few cases arise, but also very little water is stored, and barrels are kept by very few people. Wells do not appear to be a source of trouble, probably owing to the constant withdrawal of water. I have seen a good many samples of well water, but the finding of larvæ in them is rare. It is hoped to clear a good many trees and bushes, etc., from the town as an anti-mosquito measure, and also from the point of view of airing and drying the town. Water tanks are kept under supervision as regards screening. A large area on the west side of the town has been cleared as a recreation ground, which will do away with a considerable area of high grass, and a large drain, west of this, has been cut connecting two small streams. It is hoped that this will assist in drying this area.

Oiling is not a valuable measure in Bonthe, as practically all water is tidal.

Slaughtering.—The present slaughterhouse is insanitary and dilapidated. The building of a new one is under consideration and will be built if the money can be raised.

A site for slaughtering in York Island has been prepared, and a butcher appointed who will be responsible for its upkeep.

Market.—A general market of a primitive nature, but I think probably adequate for present needs, is in course of construction on a reclaimed portion of Heddle swamp.

Vaccination.—The Junior Sanitary Inspector carries this out, and has a day allotted for Bonthe and half-a-day for York Island. But the people are refractory, and compulsory vaccination for this district is at present under consideration. Bonthe being a port, and traffic to and from the Protectorate render this desirable.

An arrangement with the district commissioner has been made whereby a motor launch may be used by the vaccinator for the purpose of visiting riverside villages.

A scheme is at present under consideration whereby the district commissioner would take the vaccinator on tour under strict supervision, and would personally inspect the cases himself.

An isolation hospital is at Kila. It consists of two native huts. The accommodation is for four males and four females. Accommodation is also provided for an attendant, and a double kitchen is provided. Other necessities will be built should occasion arise.

Prosecutions 1924.—

A. SUCCESSFUL :

				£	s.	d.
Weeds	...	...	128	16	10	0
Mosquito larvæ	...	...	13	3	7	6
Obstruction	...	...	2	0	13	0
Other offences	...	...	135	19	1	6
Total	...		278	39	12	0

B. CAUTIONED ... 33

C. A & B ... 311

31. The following works were carried out in the Protectorate other than Freetown by the Public Works Department:—

- (i) Repairs to well pumps at Makeni.
- (ii) Improvements to and partial reconstruction of dam at Moyamba.
- (iii) Erecting standpipe, Sembehun.
- (iv) Construction of slaughterhouse at Bo.
- (v) Improving district commissioner's water supply, Waterloo.

E—MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

32. The usual courses of lectures to sanitary learners in connection with the syllabus laid down in the regulations were given by the Medical Officer of Health. These courses were also taken by male nurses in training at the Connaught Hospital. Sanitary learners also received instruction in office routine, outdoor sanitary work in all its branches, police court duties and so on, under the supervision of the Medical Officer of Health and Superintendent Sanitary Inspectors.

F—VITAL STATISTICS.

	Population, 1921 Census.	Births Registered.	Rate per 1,000.	Deaths Registered.	Rate per 1,000.
Freetown	44,142	982	22·2	1,143	25·9
Colony other than Freetown ...	41,021	825	20·1	789	19·2

The death-rate of 25·9 per 1,000 in Freetown in 1924 compares with a rate of 30 per 1,000 in 1923, the actual number of deaths being 1,332 in 1923 and 1,143 in 1924. There was an increase in the number of births registered from 853 in 1923 to 982 in 1924, but in spite of the efforts of the Registrar's officer, assisted by the sanitary staff, registration of births must still be regarded as incomplete.

33. (1) The subjoined table, showing the number of deaths month by month in Freetown indicates the decrease as compared with 1923 as spread over the whole year. May, June, July, August, still show the highest death-rate.

TABLE SHOWING THE NUMBER OF DEATHS OCCURRING IN FREETOWN
EACH MONTH IN 1923 AND 1924.

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1923 ...	92	95	98	115	104	118	167	129	106	120	100	88
1924 ...	85	89	82	79	106	119	133	107	94	95	84	70

(2) The infant mortality rate (i.e. the number of deaths under one year per 1,000 registered births) in Freetown was 321 in 1924 as compared with 437 in 1923, and the actual number of infant deaths was 316 in 1924 and 373 in 1923.

Age at Death.	Infant Mortality Rate.		Percentage of Total Infant Mortality.		Births Registered.	
	1924.	1923.	1924.	1923.	1924.	1923.
Under 14 days ...	169	197	53	45	932	853
14 days to 1 month ...	24	17	7	4	...	...
1 to 3 months ...	35	70	11	16	...	...
3 to 6 months ...	45	61	14	14	...	...
6 to 9 months ...	31	52	10	12	...	...
9 to 12 months ...	17	39	5	9	...	...

Deaths of infants under one year.

1924.	1923.
316	373

(3) It is seen that 53 per cent. of the infant mortality rate was composed of deaths during the first fourteen days of life; and that 60 per cent. was composed of deaths during the first month of life. As compared with 49 per cent. for the first month of life last year, this may appear disheartening in view of the fact that an Infant Welfare Centre was opened in February, 1924, but in comparing the whole figures there is seen a very great reduction in the infant mortality and a gratifying reduction in the one to twelve-month rate.

(4) We have not yet got the confidence of the expectant mothers to any extent nor have the bad methods of midwifery, ignorance and carelessness in treatment of the newly born been eliminated. In the near future, with two more welfare centres, a lady medical officer, and more trained midwives, vastly improved figures are to be expected.

RECOMMENDATIONS FOR FUTURE WORK.

- (1) New infectious diseases hospital for Freetown.
- (3) Wharf disinfection station.
- (3) Improved methods of refuse disposal for Freetown.
- (4) Improved scheme for King Jimmy market.
- (5) Water supply for Bonthe.

Of last year's recommendations, with the exception of Infant Welfare (2) none was in full swing during the year.

The completion of the Ordnance survey (1) is hoped for this year.

The medical officer for school inspection (3) could not be obtained till 1925. (5) and (6) were started in 1924.

VI—METEOROLOGICAL.

During 1924, the rainfall recorded at Tower Hill showed 149·67 inches; this almost reaches the average for the past forty years, viz. 152·47 inches. The wettest month was August in which 36·4 inches were recorded; the greatest precipitation in one day was 6·05 inches on 21st September.

Records of temperature, humidity, and rainfall at the various stations for 1924 are given in Table III.

H. O'HARA MAY,
Deputy Director of Sanitary Service.



TABLE I.

A—MEDICAL STAFF.

Office.	Name.	Absent on Leave						Remarks.
		From			To			
Director of Medical and Sanitary Services ...	F. J. A. Beringer ...	{ 1 1 24	{ 2 3 24		1 3 24	{ 7 5 24		{ On leave with full pay. On leave with half pay. Retired 8th May, 1924.
„	W. J. D. Inness			{ Appointed 8th May, 1924. Assumed duty 1st August, 1924.
Deputy Director of Medical Service ...	J. B. Bate ...	11 6 24	21 11 24					Retired on pension 28th May, 1924.
Senior Medical Officer	J. C. Murphy ...	6 8 24	31 12 24					
„	A. M. Dowdall ...	23 7 24	31 12 24					
Medical Officer ...	J. M'Conaghy ...	12 4 24	...					
„	J. Y. Wood ...	1 1 24	3 7 24					
„	M. Jackson ...	1 1 24	16 1 24					
„	J. M. Mackay, M.C. ...	6 2 24	5 12 24					
„	J. D. Dimock ...	...			...
„	E. S. Walls ...	1 1 24	20 6 24					
„	J. W. Hartley ...	1 1 24	6 6 24					
„	W. A. A. Malone ...	{ 26 1 24	{ 10 12 24		3 2 24	{ Local leave. Vacation leave.		
African Medical Officer	W. O. Taylor ...	9 2 24	21 3 24		Retired on pension 22nd March, 1924.			
„	E. J. Wright ...	1 1 24	19 1 24					
„	M. C. F. Easmon ...	...			...
„	E. H. Cummings ...	...			...
„	G. N. Metzger ...	...			...
„	E. A. Renner ...	2 4 24	12 9 24					
„	W. B. Hughes ...	...			...

B—SANITARY STAFF.

Deputy Director of Sanitary Service ...	H. O'Hara May ...	20	8	24	21	11	24	Promoted S.S.O., Nigeria.
Senior Sanitary Officer	Major W. H. Peacock		...			...
Medical Officer of Health ...	W. Allan ...		...			...
Superintendent Sanitary Inspector ...	D. S. Bowen ...	1	1	24	16	1	24	
„	G. V. Herd ...	1	1	24	1	8	24	

C—NURSING STAFF.

Matron and Senior Nursing Sister ...	Miss L. R. Stevens	16	4	24	24	10	24
Senior Nursing Sister	Miss K. G. Appleton	19	3	24	29	8	24
„	Miss C. Littlewood	1	1	24	29	2	24
Nursing Sister ...	Miss I. Stevens ...	...	...	...	...	...	...
„	Miss V. Bell ...	20	8	24	31	12	24

TABLE I—*continued.*

D—AFRICAN MEDICAL SUBORDINATE STAFF.

Office.	Name.	Absent on Leave						Remarks.
		From			To			
Chief Dispenser ...	O. E. King ...	1	7	24	30	9	24	Retired on pension 1st January, 1925.
Store-keeper and Assistant Chief Dispenser	E. G. Luke ...	...			...
Assistant Chief Dispenser ...	D. T. Betts ...	...			...
First Class Dispenser	W. A. Macauley ...	9	10	24	8	12	24	
" "	I. H. Wright ...	...			...
" "	O. E. Nylander ...	...			...
" "	H. E. Frazer ...	18	1	24	17	3	24	
" "	P. J. John ...	1	1	24	13	1	24	
" "	M. O. Frazer ...	...			...
" "	M. P. Neville ...	...			...
" "	P. Q. A. John ...	...			...
Second Class Dispensers	Eight	...			...
Third Class Dispensers	Thirteen	...			...
Laboratory Assistant ...	J. T. Roberts ...	...			...
African Senior Female Nurse ...	Miss B. C. Cole ...	...			...
" "	Miss L. Cline ...	...			...
African Male Nurses and Apprentices ...	Twenty-five	...			...
African Female Nurses and Probationers ...	Twenty-two	...			...

E—AFRICAN SANITARY SUBORDINATE STAFF.

District Nurse ...	Miss B. O. Cole ...	...	...
Public Vaccinator ...	S. H. Brown ...	...	...
Fifth Grade Sanitary Inspector ...	E. A. Nicholson and nine others ...	...	...
Sanitary Learners ...	Nine	...	...

F—CLERICAL STAFF.

First Grade Clerk ...	M. W. Frazer ...	2	1	24	6	3	24	
Second Grade Clerk ...	S. G. Randall ...	11	6	24	10	8	24	
"	M. St. G. Auber ...	...			...
Third Grade Clerks ...	Four	...			...
Fourth Grade Clerks ...	Seven	...			...

TABLE II.

SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN.

1. FREETOWN.

—	Approximate Area.	Number of Proclaimed Open Spaces.
—	} 2 $\frac{3}{4}$ square miles.	2 Public recreation grounds.

2. POPULATION.

—	No. of Natives.		No. of Europeans.		Total.
	Males.	Females.	Males.	Females.	
1921 Census	24,830	19,312	700	71	44,913

3. HOUSING.

—	Number Occupied by Europeans.	Number Occupied by Natives.
Number of houses : 1921 Census	162	6,350 and 121 unoccupied.

4. MOSQUITO—PROTECTION OF HOUSES.

1924.					1923.			
Name of Town.	Number wholly Mosquito protected.	Number with Mosquito Proof Rooms.	Number wholly protected during the Year.	Number partially protected during the Year.	Number wholly Mosquito protected.	Number with Mosquito Proof Rooms.	Number wholly protected during the Year.	Number partially protected during the Year.
Freetown

Number of huts :

1922	} Included in the number of native houses.
1923 ... ..	...	...	...
1924 ... ..	...	...	...

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

—	1922.	1923.	1924.
Number of houses built without sanction
Number of huts built without sanction

TABLE II—continued.

ACTION TAKEN.				
		Number of Prosecutions.		
		Huts.	Houses.	
1922
1923
1924

6. LATRINES.

					For Males.		For Females.	
					Number.	Number of Seats.	Number.	Number of Seats.
Number of public latrines :—								
1922	... ..	...	...	...	12	98	12	73
1923	... ..	...	...	...	12	98	12	73
1924	... ..	...	...	...	12	98	12	73
Number of new public latrines erected during the year :—								
1922	... ..	...	...	...	...	...	...	...
1923	... ..	...	...	...	...	...	...	...
1924	... ..	...	...	...	...	...	...	...

						1922.	1923.	1924.
Number of private latrines						291	306	459*
Average number of pails of night-soil removed daily ...						340	316	479
Average number of soiled pails removed and cleaned pails substituted ... ..						...	...	...
Number of night-soil men employed to clean latrines and remove excreta						Prisoners employed + 11		
Number of cesspools						4,329	4,325	4,371
Number of cesspools cleansed						2,321	1,033	1,096
Number of new cesspools constructed during the year ...						73	63	114
Number of old cesspools abolished						69	67	68

7. REMOVAL OF REFUSE.

						1922.	1923.	1924.
Number of dust bins						73	71	72
Number of carts (if employed) at work						5	6	6
Amount of refuse removed daily from streets						about 35 tons.		
Number of carts (if employed) at work daily, etc.						5	6	6
Amount of refuse removed daily, etc. ... ..						...	...	...
Number of men employed for removing refuse ... ..						...	...	...

*Includes schools and public buildings.

TABLE II.—*continued.*

8. MODE OF DISPOSAL OF EXCRETA, REFUSE AND OFFAL.

	Daily Average Number of Pails of Excreta.			Daily Average Number of Cartloads of Refuse.			Daily Average Number of Cartloads of Slaughter- house and Market Offal.		
	1922.	1923.	1924.	1922.	1923.	1924.	1922.	1923.	1924.
Buried or trenched
Burnt
Thrown into sea
Otherwise dealt with

9. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES,
BROKEN CROCKERY AND OTHER INCOMBUSTIBLE MATERIAL REMOVED
FROM HOUSES, HUTS, AND COMPOUNDS.

1922.	1923.	1924.
12	12	12

10. WATER SUPPLY.

Nature of Water Supply.	1922.	1923.	1924.
Pipe-borne water :— Source (river, lake or spring) :— Number of stand-pipes along roads	213	214	216
Number of stand-pipes in compounds and houses ...	434	443	463
Wells :— Public : Number	1	1	1
Number with pumps protected against surface water and mosquito-protected . . . . .	...	...	...
Private : Number	2	Nil	Nil†
Number protected against surface water and mosquito- protected ... ..	...	...	...
*Tanks :— Public : Number	5	4	4
Number mosquito-protected ... ..	...	...	...
Private : Number	29	35	35
Number mosquito-protected	9	15	15
Nature of tanks : Wood ... ..	...	...	...
Iron	31	21	21
Concrete	12	18	14
Barrels :— Number	1,132 .	2,025	1,448
Number mosquito-protected	223	231	256

* The heading "Tanks" covers all fixed receptacles (including reservoirs) for storage of water.
† One private well was discovered during 1924 and closed immediately.

TABLE II—*continued*.

11. DRAINAGE.

Nature of Drainage.	Public.	Private.
Masonry drains :—		
Linear yards of masonry drains :		
1922	12,808	...
1923	13,964	...
1924	15,693	...
Linear yards reconstructed during the year :		
1922 ... ..	...	...
1923	32	...
1924	366	...
Linear yards repaired during the year :		
1922 ... ..	...	...
1923	62	...
1924	777	...
Linear yards of new drains constructed during the year :		
1922	1,149	...
1923	1,156	...
1924	1,729	...
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :		
1922	37,080	...
1923	40,122	...
1924	39,809	...
Number of linear yards of ditches dug and graded :		
1922 ... ..	...	...
1923	63	...
1924	224	...
Average frequency of clearing ditches of grass :		
1922	} Quarterly.	...
1923 ... ..		...
1924 ... ..		...

12. INSPECTIONS AND PROSECUTIONS.

	1922.	1923.	1924.
Number of Inspectors employed	19	19	19
Number of houses inspected	93,642	98,002	100,656
Number of houses where larvæ were found	373	578	353
Number of notices served to remove conditions causing the breeding of larvæ ... ..	...	...	...
Number of persons fined for having mosquito larvæ on premises	330	474	314
Number of notices served to remove insanitary conditions on premises	8,501	7,903	9,206
Number of persons fined for not removing insanitary conditions after notice	105	127	87
Number of soda and aerated water factories inspected	1	1	...

TABLE III.
METEOROLOGICAL RETURNS.

STATION—FREETOWN (TOWER HILL).

Latitude $8^{\circ} 29' 30''$ N. Longitude $13^{\circ} 13' 55''$ W.

MONTH.			Absolute Shade, Maximum.	Absolute Shade, Minimum.	Average, Maximum.	Average, Minimum.	Relative Humidity.	Rainfall in Inches.
January	...	...	94	62	89	74	71	·07
February	...	...	93	70	88	72	68	·56
March	...	...	94	72	91	75	69·5	·93
April	...	...	93	71	90	76	72·5	2·72
May	...	...	94	70	90	74	73·5	7·52
June	...	...	91	69	86	72	82·5	26·52
July	...	...	87	69	83	71	83·5	29·35
August	...	...	86	68	81	71	86	36·40
September	...	...	87	68	83	70	86	32·57
October	...	...	88	67	86	71	79	7·52
November	...	...	89	67	86	71	78	5·51
December	...	...	90	67	88	71	69·5	...
The Year			94	62	87	72	77	149·67

STATION—BONTHE (SHERBRO).

Latitude $7^{\circ} 32'$ N. Longitude $12^{\circ} 30'$ W.

January	...	...	91	63	88	70	84	·10
February	...	...	95	67	90	70	78	·66
March	...	...	97	70	92	72	74·5	2·70
April	...	...	95	70	92	74	79	4·24
May	...	...	96	72	92	75	81	6·96
June	...	...	93	70	86	73	85	20·46
July	...	...	85	67	81	71	85	34·86
August	...	...	85	...	83	...	89	29·78
September	...	...	89	...	83	...	88	20·99
October	...	...	93	...	88	...	83	11·08
November	...	...	98	...	89	...	84	6·82
December	...	...	93	63	88	71	76	·02
The Year			98	63	88	72	82	138·67

TABLE III—*continued*.

STATION—Bo.

Latitude 7° 56' N. Longitude 11° 47' W.

MONTH.			Absolute Shade, Maximum.	Absolute Shade, Minimum.	Average, Maximum.	Average, Minimum.	Relative Humidity.	Rainfall in Inches.
January	..	...	94	58	90	67	74·5	·33
February	...	...	98	65	94	68	68·5	1·26
March	...	...	100	67	94	69	73	3·45
April	...	...	97	65	92	68	78	9·35
May	...	...	94	66	91	69	82	6·50
June	...	...	90	67	86	69	84·5	18·78
July	...	...	87	65	83	69	85	18·42
August	...	..	89	67	82	69	87·5	19·02
September	...	...	89	67	83	69	87·5	20·17
October	...	...	90	66	86	69	83·5	15·14
November	...	...	91	67	88	68	85	11·41
December	...	...	91	59	88	67	76·5	·75
The Year			100	58	88	68	80·5	124·58

STATION—BATKANU.

Latitude 9° 4' N. Longitude 12° 26' W.

January	...	...	96	55	93	66	84·5	·30
February	...	...	100	63	95	67	83	1·
March	...	...	101	64	95	67	81·5	...
April	...	...	99	64	96	67	84·5	6·10
May	...	...	99	63	96	66	84	13·70
June	...	...	96	58	93	65	74	13·30
July	...	...	96	61	92	65	86·5	25·85
August	...	...	95	62	89	65	86·5	18·60
September	...	...	95	63	92	66	87	25·20
October	...	...	95	64	92	66	88	17·40
November	...	...	96	56	92	62	80	10·52
December	...	...	95	50	91	57	65	...
The Year			101	50	93	65	82	131·97

TABLE III—*continued*.

STATION—KABALLA.

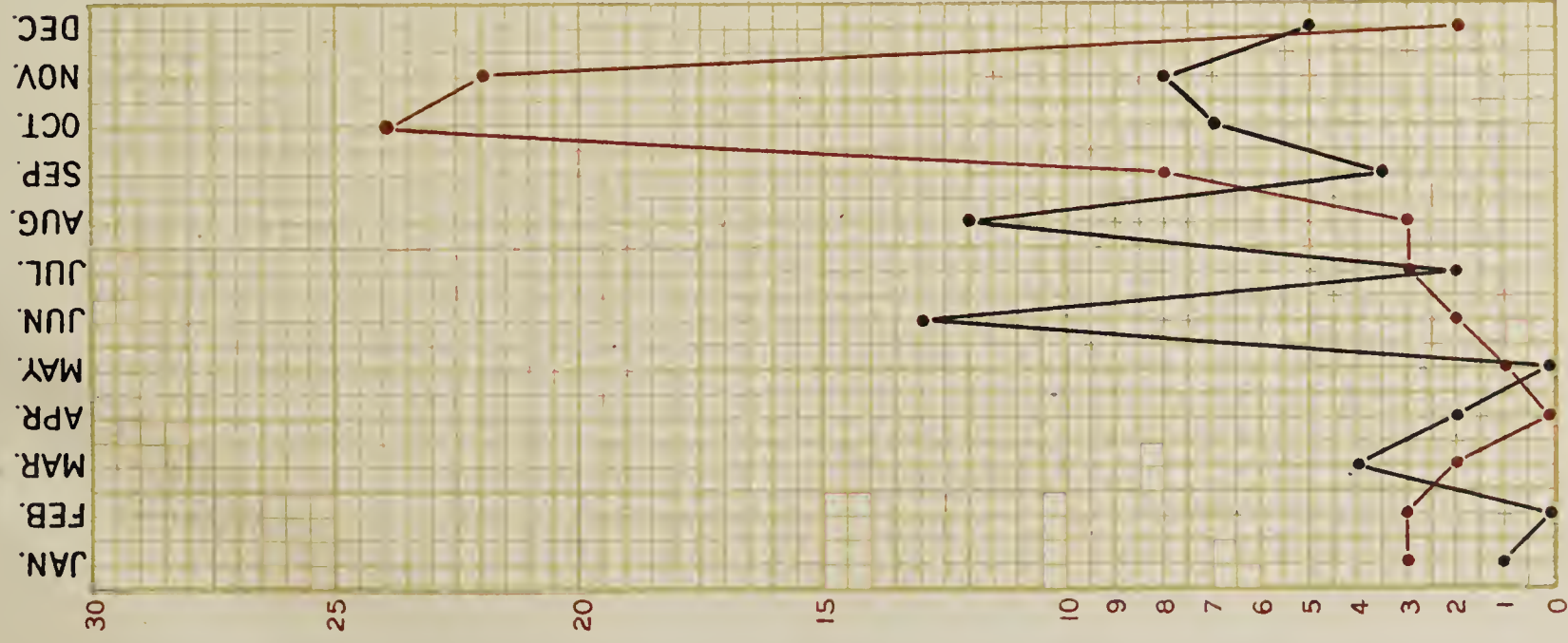
Latitude 9° 34' N. Longitude 11° 31' W.

MONTH.			Absolute Shade, Maximum.	Absolute Shade, Minimum.	Average. Maximum.	Average, Minimum.	Relative Humidity.	Rainfall in Inches.
January	...	...	95	68	93	71	75	·32
February	...	...	97	76	94	78	69	2·85
March	...	...	102	70	97	77	69	·31
April	...	...	100	65	95	70	70	2·20
May	...	...	98	67	92	70	75	9·39
June	..	...	93	65	89	68	79	13·80
July	...	...	91	63	88	67	81·5	12·61
August	...	...	95	64	87	67	82·5	14·91
September	...	...	93	64	88	67	84·5	17·10
October	...	...	92	64	88	67	85	11·42
November	...	...	92	57	89	67	81·5	7·09
December	...	...	94	54	89	59	71·5	...
The Year			102	54	91	69	77	92·0

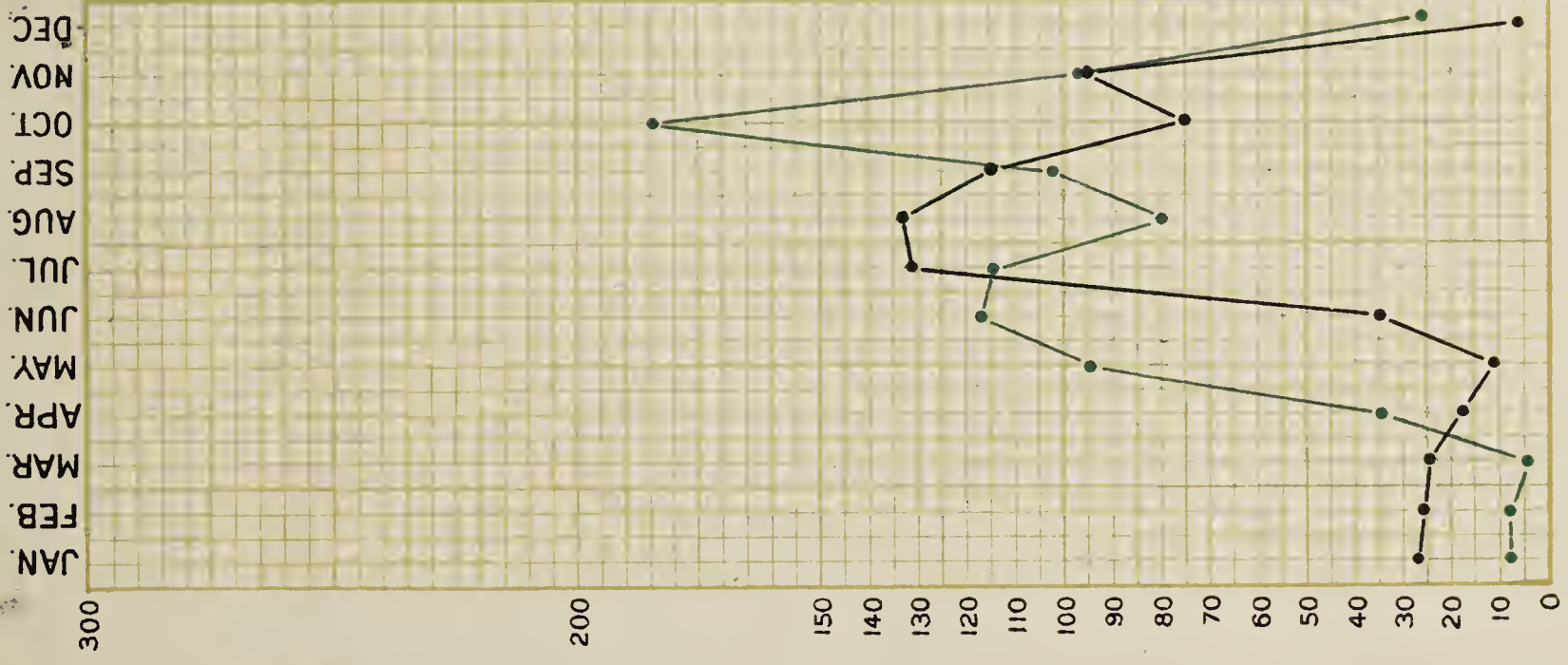


BREEDING PLACES OF MOSQUITOES FOUND IN 1924. - 1084.

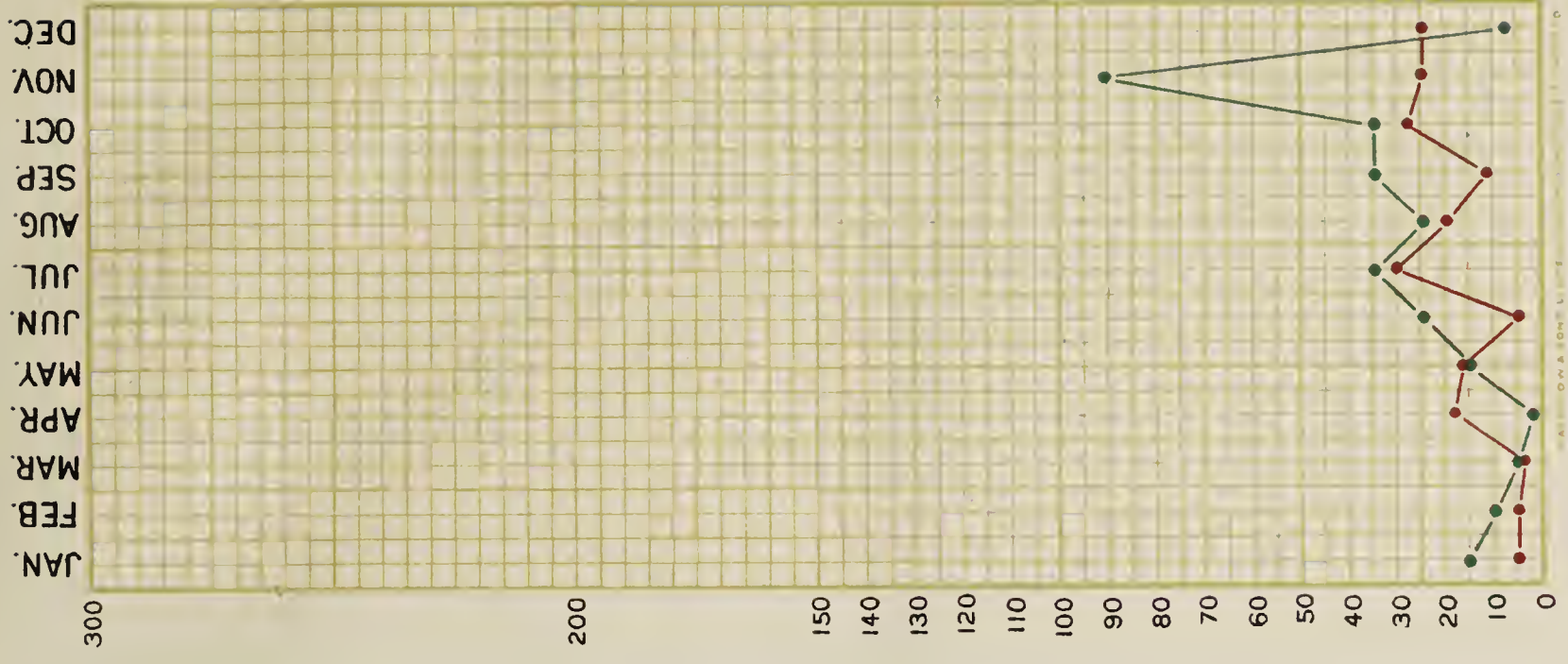
GENUS ANOPHELINEAE



GENUS STEGOMYIAE



OTHER GENERA



RAINFALL — SIERRA LEONE, WITH AVERAGE FOR 40 YEARS 1885-1924.



RED. 40 YEARS AVERAGE RAINFALL 1885-1924 151.10 INCHES.

BLACK. RAINFALL 1924. 149.69 INCHES.

GREEN 1924 TOTAL MOSQUITO BREEDING PLACES DISCOVERED, 1084.

ECLAMPSIA — SEASONAL INCIDENCE

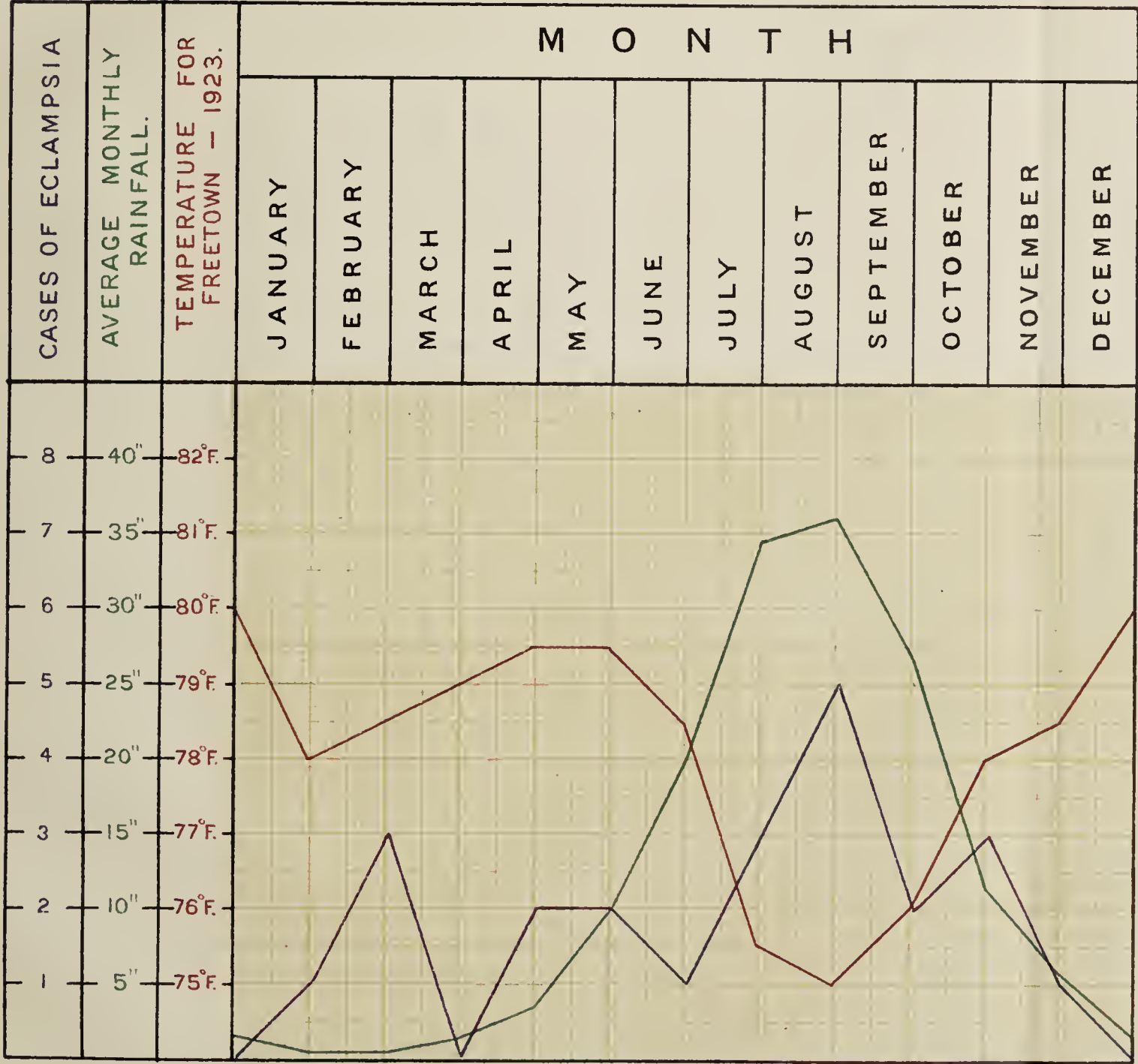


TABLE VI.
RETURN OF DISEASES AND DEATHS.
EUROPEAN.

Diseases.	*IN-PATIENTS.					OUT-PATIENTS.	
	§Remaining in Hospital at end of 1923.	TOTAL		†Total Cases treated.	||Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
INFECTIVE DISEASES.							
Beri-beri							
Cerebro-spinal fever ...							
Chicken-pox							
Cholera							
Dengue							
Diphtheria							
Dysentery:—							
(a) Amœbic ... ..	...	3	...	3	...	2	
(b) Bacillary							
(c) Type not deter- mined ... ..	...	1	...	1	1		
Endocarditis—infective							
Enteric							
Erysipelas ... ..	...	1	...	1			
Gonorrhœa ... ..	...	...	...	..	...	2	
Influenza							
Kala-azar							
Leprosy:—							
(a) Nodular							
(b) Anæsthetic							
Malaria:—							
(a) Tertian ... ..	...	...	...	...	...	1	
(b) Quartan							
(c) Aestivo-autumnal ...	...	11	2	11	1	18	
(d) Chronic							
(e) Type not deter- mined	1	49	...	50	2	39	
Blackwater fever ... ..	...	2	...	2	...	3	1
Measles							
Papataci fever							
Plague							
Pneumonia							
Pyrexia of uncertain origin ... ..	...	2	...	2	1	5	
Rabies							
Relapsing fever							
Rheumatic fever							
Septicæmia							
Smallpox							
Syphilis :—							
(a) Primary ... ..	...	...	...	...	...	1	
(b) Secondary †							
(c) Inherited							
Tetanus							
Trypanosomiasis (sleep- ing sickness)							
Tuberculosis ... ..	...	3	...	3			
Carried forward ...	1	72	2	73	5	71	1

*In-patients are those treated in hospitals and institutions, and the term does not apply to those treated in their own quarters, even though they would ordinarily be in-patients if there were suitable accommodation.

†“Tertiary Syphilis” is a term sometimes applied to the later symptoms.

‡“Total cases treated” will, of course, include those remaining in hospital at the end of the previous year.

§i.e., the year previous to that for which the return is made.

||The figures in this column to be carried on to the next month's return.

TABLE VI—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
INFECTIVE DISEASES— <i>continued.</i>							
Brought forward ...	1	72	2	73	5	71	1
Undulant fever ...							
Whooping cough ...							
Yaws ...							
Yellow fever ...							
Other diseases ...							
INTOXICATIONS.							
Alcoholism ...	...	1	...	1			
Morphinism ...							
Other intoxications ...							
GENERAL DISEASES.							
Anæmia ...	...	1	...	1			
Anæmia—pernicious ...							
Diabetes ...							
Exophthalmic goitre ...							
Gout ...							
Leucocythæmia ...							
Lymphadenoma ...							
Myxœdema ...							
Purpura ...							
Rickets ...							
Scurvy ...							
Other diseases ...	...	...	...	...	...	51	
LOCAL DISEASES.							
<i>Diseases of the Nervous System.</i>							
Sub-section 1.							
Diseases of the Nerves:—							
Neuritis ...	...	1	...	1			
Meningitis ...							
Myelitis ...							
Hydrocephalus ...							
Encephalitis ...							
Abscess of brain ...							
Congestion of brain ...							
Other diseases ...							
Sub-section 2.							
Nervous Disorders of Un- determined Nature:—							
Apoplexy ...							
Paralysis ...							
Chorea ...							
Epilepsy ...							
Carried forward ...	1	75	2	76	5	122	1

TABLE VI—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
LOCAL DISEASES.—							
<i>continued.</i>							
Brought forward ...	1	75	2	76	5	122	1
Neuralgia ...	...	...	...	...	...	7	
Hysteria ...	...	...	...	...	...
Other diseases ...	...	8	...	8	...	5	
Sub-section 3.—Mental Diseases :—							
Idiocy ...	...	...	...	...	...
Mania ...	...	...	...	...	...
Melancholia ...	...	...	...	...	...
Dementia ...	...	...	...	...	...
Delusional insanity ...	...	1	...	1	...		
Other diseases ...	...	...	...	...	...
<i>Diseases of the Eye.</i>							
Conjunctivitis ...	...	...	...	...	...	7	
Keratitis ...	...	...	...	...	...
Ulceration of cornea ...	...	...	...	...	...
Iritis ...	...	...	...	...	...	2	
Optic neuritis ...	...	...	...	...	...
Cataract ...	...	...	...	...	...
Other diseases ...	...	...	...	...	...
<i>Diseases of the Ear.</i>							
Inflammation ...	...	...	...	...	...	3	
Other diseases ...	...	...	...	...	...	2	
<i>Diseases of the Nose.</i>							
Inflammation ...	...	...	...	...	...
Other diseases ...	...	...	...	...	...	4	
<i>Diseases of the Circula- tory System.</i>							
Pericarditis ...	...	...	...	...	...
Endocarditis ...	...	...	...	...	...
Valvular Disease :—							
(a) Mitral ...	...	...	...	...	...
(b) Aortic ...	...	...	...	...	...
(c) Tricuspid ...	...	...	...	...	...
(d) Pulmonary ...	...	...	...	...	...
Arterio-sclerosis ...	...	...	...	...	...
Aneurism ...	...	...	...	...	...
Other diseases ...	...	13	...	13	...	2	
Carried forward ...	1	97	2	98	5	154	1

TABLE VI—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
LOCAL DISEASES.—							
<i>continued.</i>							
Brought forward ...	1	97	2	98	5	154	1
<i>Diseases of the Respiratory System.</i>							
Laryngitis ...							
Bronchitis ...	...	..	...	...	...	30	
Broncho-pneumonia ...							
Abcess of lung ...							
Gangrene of lung ...							
Emphysema ...							
Pleurisy ...	...	...	...	...	...	1	
Empyema ...	...					
Other diseases ...	...	2	...	2	...	5	
<i>Diseases of the Digestive System.</i>							
Stomatitis ...	...	...	...	...	...	1	
Caries of teeth ...	...	1	...	1	...	7	
Pyorrhœa alveolaris ...							
Glossitis ...	...					
Sore throat ...	...	2	...	2	...	8	
Inflammation of tonsils ...	...	...	...	...	...	21	
Gastritis ...	...	2	...	2	...	9	
Ulceration of stomach ...	...	1	...	1			
Hæmatemesis ...	...	1	...	1			
Dilatation of stomach ...							
Stricture of stomach ...							
Dyspepsia ...	...	...	...	...	...	23	
Enteritis ...	...	1	...	1			
Appendicitis ...							
Colitis ...	...					
Ulceration of intestines ...							
Sprue ...	...					
Hernia ...	...					
Diarrhœa ...	...	...	...	...	...	30	
Constipation ...	...	1	...	1	...	13	
Colic ...	...	...	...	...	...	3	
Hæmorrhoids ...	...	...	...	...	...	5	
Pancreatitis ...							
Hepatitis—acute ...	...	3	...	3	...	3	
Abscess of liver ...							
Cirrhosis of liver ...							
Jaundice ...	1	1	...	2	...	1	
Peritonitis ...	...					
Ascites ...	...					
Other diseases ...	...	...	...	...	...	4	
Carried forward ...	2	112	2	114	5	318	1

TABLE VI—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL.		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
LOCAL DISEASES— <i>continued.</i>							
Brought forward ...	2	112	2	114	5	318	1
<i>Diseases of the Lymphatic System.</i>							
Inflammation of lym- phatic gland ...							
Splenitis ...	...	2	...	2	...	1	
Suppuration of lympha- tic gland ...	...	1	...	1	...	2	
Lymphangitis ...	...	1	...	1	1	1	
Elephantiasis ...							
Other diseases ...							
<i>Diseases of the Urinary System.</i>							
Acute nephritis ...							
Bright's disease ...							
Pyelitis ...							
Calculus ...							
Renal colic ...							
Cystitis ...							
Vesical calculus ...	...	1	...	1			
Suppression ...							
Hæmaturia ...							
Chyluria ..							
Other diseases ...							
<i>Diseases of the Generative System.</i>							
Male organs :—							
Urethritis ...	...	...	...	...	...	1	
Gleet ...							
Stricture ...							
Prostatitis ...							
Soft Chancre ...							
Condyloma ...							
Inflammation of scrotum							
Hydrocele ...							
Orchitis ...	...	1	...	1			
Epididymitis ...							
Abscess in testicle ...							
Other diseases ...	...	1	...	1			
Female organs:—							
Ovaritis ...							
Ovarian cyst ...							
Endometritis ...							
Displacement of uterus							
Vaginitis ...							
Carried forward ...	2	119	2	121	6	323	1

TABLE VI—*continued.*

Diseases.	IN PATIENTS.					OUT-PATIENTS	
	Remaining in Hospital at end of 1923.	TOTAL.		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
LOCAL DISEASES.— <i>continued.</i>							
Brought forward ...	2	119	2	121	6	323	1
<i>Diseases of the Generative System—contd.</i>							
Female organs, <i>contd.</i>							
Amenorrhœa ...							
Dysmenorrhœa ...							
Menorrhagia ...							
Leucorrhœa ...							
Other diseases ...							
<i>Affections connected with Pregnancy.</i>							
Abortion ...							
Other affections ...							
<i>Affections connected with Parturition.</i>							
Delayed labour ...							
Retained placenta ...							
Premature birth ...							
Other affections ...							
<i>Affections consequent on Parturition.</i>							
Post-partum hæmorrhage							
Puerperal septicæmia ...							
Mastitis ...							
Abscess of breast ...							
Other affections ...							
<i>Diseases of Organs of Locomotion.</i>							
Osteitis ...							
Arthritis ...	...	...	...	...	...	1	
Spondylitis ...							
Bursitis ...							
Myalgia ...	...	...	...	...	...	5	
Other diseases ...	...	3	...	3	...	18	
<i>Diseases of Connective Tissue.</i>							
Cellulitis ...	...	...	...	...		2	
Abscess ...	...	3	...	3		3	
Other diseases ...							
<i>Diseases of the Skin.</i>							
Ulcer ...	...	...	...	...	...	2	
Urticaria ...	...	2	...	2			
Eczema ...	...	...	...	...	...	2	
Carried forward ...	2	127	2	129	6	356	1

TABLE VI—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
LOCAL DISEASES.— <i>continued.</i>							
Brought forward ...	2	127	2	129	6	356	1
<i>Diseases of the Skin— continued.</i>							
Boil ... ..	...	2	...	2			
Carbuncle ... ..	...					
Herpes ... ..	...					
Psoriasis ... ..	...	...	...	...	...	3	
Oriental sore ... ..	...					
Tinea ... ..	...	1	...	1	...	3	
Scabies ... ..	...	1	...	1	...	1	
Acne ... ..	...					
Prickly heat ... ..	...					
Other diseases ... ..	...	...	...	...	...	5	
<i>Injuries.</i>							
General ... ..	...	4	...	4	1	1	
Local	1	4	...	5	...	23	
<i>Tumours.</i>							
Benign ... ..	...	1	...	1			
Malignant ... ..	...					
Malformations ... ..	...					
<i>Poisons.</i>							
Vegetable ... ..	...					
Animal ... ..	...	1	...	1			
Other poisons ... ..	...					
<i>Parasites.</i>							
<i>Animal Parasites</i>							
Protozoa ... ..	...					
Trematoda (flukes) ... ..	...					
Other parasites ... ..	...	...	...	...	...	2	
Cestoda :—							
Tænia solium ... ..	...					
Tænia saginata ... ..	...					
Other cestodes ... ..	...					
Nematoda :—							
Ascaris ... ..	...					
Trichocephalus dispar ... ..	...					
Trichina ... ..	...					
Dracunculus ... ..	...					
Filaria ... ..	...					
Strongylus ... ..	...					
Ankylostomum ... ..	...					
Oxyuris ... ..	...					
Other nematodes ... ..	...					
Insecta :—							
Insects producing ... ..	...					
Myiasis ... ..	...					
Dematophilus ... ..	...					
penetrans ... ..	...					
Other insects ... ..	...					
No appreciable diseases	...	8	...	8	...	1	
Total ...	3	149	2	152	7	395	1

TABLE VII.
RETURN OF DISEASES AND DEATHS.
NATIVE.

Diseases.	*IN-PATIENTS.					OUT-PATIENTS.	
	§Remaining in Hospital at end of 1923.	TOTAL.		‡Total Cases treated.	|| Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
INFECTIVE DISEASES.							
Beri-beri ... ..	...	2	...	2			
Cerebro-spinal fever ...							
Chicken-pox	1	25	...	26	2	18	
Cholera							
Dengue							
Diphtheria							
Dysentery :—							
(a) Amoebic ... ..	...	39	4	39	...	62	
(b) Bacillary ... ..	...	...	...	...	...	1	
(c) Type not deter- mined ... ..	...	25	1	25	...	348	
Endocarditis—infective							
Enteric							
Erysipelas							
Gonorrhœa	2	26	...	28	3	1,218	
Influenza							
Kala-azar							
Leprosy :—							
(a) Nodular	2	6	...	8	1	3	
(b) Anæsthetic	1	...	...	1	...	16	
Malaria :—							
(a) Tertian	1	...	...	1	...	5	
(b) Quartan ... ..	...	...	...	...	...	1	
(c) Aestivo-autumnal	1	276	7	277	2	1,022	
(d) Chronic ... ..	...	9	3	9	...	2	
(e) Type not deter- mined	1	118	...	119	...	1,937	
Blackwater fever ... ..	...	1	...	1	...	1	
Measles ... ..	...	17	...	17	...	96	
Papataci fever							
Plague							
Pneumonia	3	66	18	69	2	31	
Pyrexia of uncertain origin	2	28	1	30	1	364	
Rabies							
Relapsing fever							
Septicæmia ... ..	...	14	12	14	...	1	
Smallpox ... ..	...	2	...	2			
Tetanus ... ..	...	10	6	10	...	9	
Syphilis :—							
(a) Primary ... ..	...	2	...	2	...	46	
(b) Secondary† ... ..	...	73	3	73	7	740	
(c) Inherited	7	...	...	7	...	50	
Trypanosomiasis (sleep- ing sickness) ... ..	...	2	2	2			
Tuberculosis	2	52	25	54	4	74	
Undulant fever							
Carried forward ...	23	793	82	816	22	6,045	

*In-patients are those treated in hospitals and institutions, and the term does not apply to those treated in their own quarters, even though they would ordinarily be in-patients if there were suitable accommodation.

†“Tertiary Syphilis” is a term sometimes applied to the latter symptoms.

‡“Total cases treated” include those remaining in hospital at the end of the previous year.

§i.e., the year previous to that for which the return is made.

||The figures in this column to be carried on to the next year's return.

TABLE VII—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
INFECTIVE DISEASES.— <i>continued.</i>							
Brought forward ...	23	793	82	816	22	6,045	
Whooping cough ..	...	1	...	1	...	44	
Yaws ... ..	...	7	...	7	1	146	
Yellow fever ...	...					
Other diseases ...	...	11	1	11	...	4	
INTOXICATIONS.							
Alcoholism ... ..	...	3	...	3	..	8	
Morphinism ... ..	...					
Other intoxications ...	...	1	...	1			
GENERAL DISEASES.							
Anæmia ... ..	...	9	1	9	...	457	
Anæmia, pernicious ...	...	3	2	3			
Diabetes ... ..	...					
Exophthalmic goitre ...	...	1	...	1	...	1	
Gout ... ..	..	...	...	...	...	3	
Leucocythæmia							
Lymphadenoma							
Myxædema							
Purpura ... ..	...					
Rickets ... ..	...	...	...	...	...	10	
Scurvy ... ..	...					
Other diseases ...	6	118	11	124	11	2,515	1
LOCAL DISEASES.							
<i>Diseases of the Nervous System.</i>							
Sub-section 1.—Diseases of the Nerves :—							
Neuritis	1	6	1	7	2	40	
Meningitis							
Myelitis	2	...	1	2			
Hydrocephalus							
Encephalitis							
Abscess of brain							
Congestion of brain ...							
Other diseases ...	...	4	...	4	...	29	1
Sub-section 2.—Nervous Disorders and Diseases of Undetermined Nature :—							
Apoplexy ... ..	...	1	1	1			
Paralysis	6	31	13	37	3	32	
Chorea ... ..	...					
Epilepsy	1	7	1	8	1	42	
Neuralgia ... ..	...	4	...	4	...	373	
Carried forward ...	39	1,000	114	1,039	40	9,749	2

TABLE VII—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL.		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
LOCAL DISEASES— <i>continued.</i>							
Brought forward ...	39	1,000	114	1,039	40	9,749	2
Hysteria ...	...	...	...	...	...	15	
Other diseases ...	...	16	3	16		197	
Sub-section 3.—Mental diseases.—							
Idiocy ...	...					
Mania ...	...	2	...	2	1	1	
Melancholia ...							
Dementia ...	2	21	3	23	4		
Delusional insanity...						18	
Other diseases ...	...	6	...	6	...	2	
<i>Diseases of the Eye.</i>							
Conjunctivitis ...	1	22	1	23	...	591	
Keratitis ...	...	...	...	...	...	14	
Ulceration of cornea ...	1	...	...	1	...	19	
Iritis ...	1	8	...	9	...	38	
Optic neuritis ...	...	...	...	...	...	1	
Cataract ...	...	...	...	...	...	21	
Other diseases ...	2	17	...	19	5	133	
<i>Diseases of the Ear.</i>							
Inflammation ...	...	...	...	...	...	106	
Other diseases ...	...	7	...	7	...	279	
<i>Diseases of the Nose.</i>							
Inflammation ...	...	1	...	1	...	86	
Other diseases ...	...	9	...	9	1	429	
<i>Diseases of the Circula- tory System.</i>							
Pericarditis ...	...	...	...	...	...	4	
Endocarditis ...	...	2	...	2	...	8	
Valvular Disease :—							
(a) Mitral ...	1	7	2	8	1	90	
(b) Aortic ...	...	3	...	3	1	13	
(c) Tricuspid ...							
(d) Pulmonary ...							
Arterio-sclerosis ...							
Aneurism ..	...	6	...	6	...	14	
Other diseases ...	2	27	3	29	...	90	3
<i>Diseases of the Respira- tory System.</i>							
Laryngitis ...	...	2	...	2	...	44	1
Bronchitis ...	4	108	1	112	3	5,396	
Broncho-pneumonia ...	...	10	4	10	...	10	
Abscess of lung ...							
Gangrene of lung ...							
Emphysema ...	..	1	...	1	...	1	
Carried forward ...	53	1,275	131	1,328	56	17,369	6

TABLE VII—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
LOCAL DISEASES— continued.							
Brought forward ...	53	1,275	131	1,328	56	17,369	6
<i>Diseases of the Respiratory System—continued.</i>							
Pleurisy ...	1	23	...	24	2	111	
Empyema ...	...	2	2	2	...	1	
Other diseases ...	1	35	2	36	...	459	
<i>Diseases of the Digestive System.</i>							
Stomatitis ...	...	7	2	7	...	425	
Caries of teeth ...	...	3	...	3	...	842	
Pyorrhœa alveolaris ...	...	...	...	...	...	51	
Glossitis ...	...	1	...	1	...	48	
Sore throat ...	...	2	...	2	...	187	
Inflammation of tonsils ...	...	6	...	6	...	329	
Gastritis ...	1	3	...	4	...	77	
Ulceration of stomach ...	...	1	1	1	...		
Hæmatemesis ...	...	1	...	1	...	3	
Dilatation of stomach ...	...	...	...	...	...	2	
Stricture of stomach ...							
Dyspepsia ...	1	14	...	15	...	2,914	
Enteritis ...	1	8	4	9	...	11	
Appendicitis ...	...	3	...	3	...		
Colitis ...	...	1	...	1	...	8	
Ulceration of intestines							
Sprue ...							
Hernia ...	1	56	4	57	2	271	
Diarrhœa ...	1	77	8	78	...	902	1
Constipation ...	...	12	...	12	...	5,629	
Colic ...	...	16	...	16	...	609	
Hæmorrhoids ...	...	4	...	4	...	74	
Pancreatitis ...							
Hepatitis, acute ...	...	13	1	13	1	25	
Abscess ...	...	...	...	...	...	1	
Cirrhosis ...	...	2	1	2	...	7	
Jaundice ...	...	7	1	7	1	29	
Peritonitis ...	...	6	2	6	..	1	
Ascites ...	...	13	4	13	1	32	
Other diseases ...	...	21	4	21	1	505	1
<i>Diseases of the Lymphatic System.</i>							
Splenitis ...	...	6	1	6	...	182	
Inflammation of lymphatic gland ...	...	53	...	53	2	229	
Suppuration of lymphatic gland ...	1	9	...	10	...	66	
- Carried forward ...	61	1,680	168	1,741	66	31,399	8

TABLE VII—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
GENERAL DISEASES— <i>continued.</i>							
Brought forward ...	61	1,680	168	1,741	66	31,399	8
<i>Diseases of the Lympha- tic System—continued.</i>							
Lymphangitis ...	...	...	...	...	...	6	
Elephantiasis ...	1	29	2	30	5	94	
Other diseases ...	...	...	...	...	...	49	
<i>Diseases of the Urinary System.</i>							
Acute nephritis ...	1	19	5	20	1	50	
Bright's disease ...	...	1	1	1	...	21	
Pyelitis ...	...	...	...	...	...	1	
Calculus ...	...	...	...	...	...	1	
Renal colic ...	...	...	...	...	...
Cystitis ...	1	7	2	8	...	30	
Vesical calculus ...	...	...	...	...	...
Suppression ...	...	6	...	6	...		
Hæmaturia ...	...	1	...	1	...	12	
Chyluria ...	...	...	...	...	...
Other diseases ...	...	25	1	25	1	86	
<i>Diseases of the Genera- tive System.</i>							
Male Organs :—							
Urethritis ...	...	2	1	2	...	47	
Gleet ...	...	4	...	4	1	40	
Stricture ...	...	20	2	20	...	85	
Prostatitis ...	...	...	...	...	...	1	
Soft chancre ...	...	14	...	14	1	129	
Condyloma ...	...	...	...	...	...
Inflammation of scrotum ...	...	2	...	2	...	3	
Hydrocele ...	...	5	...	5	2	105	
Orchitis ...	...	15	...	15	...	216	
Epididymitis ...	...	2	...	2	...	46	
Abscess of testicle ...	...	4	...	4	1	14	
Other diseases ...	1	42	1	43	2	89	
Female Organs:—							
Ovaritis ...	...	1	...	1	...	6	
Ovarian cyst ...	...	2	...	2	...	23	
Endometritis ...	1	3	...	4	1	49	
Displacement of uterus ...	...	1	...	1	...	3	
Vaginitis ...	...	2	...	2	...	10	
Amenorrhœa ...	...	...	...	...	...	188	
Dysmenorrhœa ...	...	...	...	...	...	100	
Menorrhagia ...	...	1	...	1	...	53	
Leucorrhœa ...	...	...	...	...	...	46	
Other diseases ...	1	19	...	20	2	152	
Carried forward ...	67	1,907	183	1,974	83	33,154	8

TABLE VII—*continued.*

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL.		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
LOCAL DISEASES— <i>continued.</i>							
Brought forward ...	67	1,907	183	1,974	83	33,154	8
<i>Affections connected with Pregnancy.</i>							
Abortion ...	...	24	1	24	...	50	
Other affections ...	..	15	1	15	1	90	
<i>Affections connected with Parturition.</i>							
Delayed labour ...	...	169	1	169	2	4	1
Retained placenta ...	...	2	...	2			
Premature birth ...	...	4	...	4			
Other affections ...	...	22	2	22	...	7	
<i>Affections consequent on Parturition.</i>							
Post-partum hæmor- rhage ...	...	2	...	2			
Puerperal septicæmia ...	...	1	...	1			
Mastitis ...	1	9	...	10	...	39	
Abscess of breast ...	1	...	...	1	...	6	
Other affections ...	...	5	3	5	...	7	
<i>Diseases of Organs of Locomotion.</i>							
Osteitis ...	1	8	...	9	...	72	
Arthritis ...	1	25	...	26	...	436	
Spondylitis ...	...	...	...	...	...	2	
Bursitis ...	...	...	...	...	...	2,280	
Myalgia ...	...	33	...	33	...	751	
Other diseases ...	2	37	...	39	1		
<i>Diseases of Connective Tissue.</i>							
Cellulitis ...	1	48	...	49	4	137	
Abscess ...	2	83	...	85	...	613	1
Other diseases ...	1	3	...	4	...	67	
<i>Diseases of the Skin.</i>							
Ulcer ...	14	283	4	297	25	6,017	
Urticaria ...	...	2	...	2	...	20	
Eczema ...	...	8	...	8	...	284	
Boil ...	...	10	...	10	...	408	
Carbuncle ...	...	2	...	2	...	8	
Herpes ...	...	1	...	1	...	39	
Psoriasis ...	...	3	...	3	...	7	
Oriental sore ...	...	...	...	...	...	152	
Tinea ...	...	...	...	...	...	438	
Scabies ...	2	...	...	2	1		
Carried forward ...	93	2,706	195	2,799	117	45,088	10

TABLE VII—continued.

Diseases.	IN-PATIENTS.					OUT-PATIENTS.	
	Remaining in Hospital at end of 1923.	TOTAL.		Total Cases treated.	Remaining in Hospital at end of 1924.	Cases treated.	Deaths.
		Admissions.	Deaths.			New.	
LOCAL DISEASES.— continued.							
Brought forward ...	93	2,706	195	2,799	117	45,088	10
Diseases of the Skin— continued.							
Acne ...	...	...	...	...	...	1	
Prickly heat ...	...	...	...	...	...	...
Other diseases ...	...	19	...	19	1	470	
Injuries.							
General ...	2	47	4	49	3	89	
Local ...	12	250	10	262	15	5,396	1
Tumours.							
Benign ...	1	5	...	6	...	86	
Malignant ...	1	19	1	20	1	4	
Malformations ...	...	2	...	2	...	1	
Poisons.							
Vegetable ...	...	...	...	...	...	...
Animal ...	...	2	..	2	...	4	
Other poisons ...	...	3	1	3	...	...
Parasites.							
Animal Parasites.							
Protozoa ...	...	...	...	...	...	...
Trematoda (flukes) ...	...	...	...	...	...	3	
Cestoda :—							
Tænia solium ...	...	3	...	3	...	137	
Tænia saginata ...	...	5	...	5	...	43	
Other cestodes ...	...	2	...	2	...	11	
Nematoda :—							
Ascaris ...	...	24	...	24	1	1,562	
Trichocephalus dispar							
Trichina ...	...	...	...	...	...	...
Dracunculus ...	...	...	...	...	...	...
Filaria ...	...	...	...	...	...	3	
Strongylus ...	...	...	..	...	...	2	
Ankylostomum ...	...	111	9	111	...	42	
Oxyuris ...	...	...	...	...	...	...
Other nematodes ...	...	...	...	...	...	1	
Insecta :—							
Insects producing myiasis ...	...	...	...	...	...	1	
Dermatophilus pene- trans ...	...	...	...	...	...	8	
Other insects ...	...	...	...	...	...	9	
No appreciable disease	...	63	...	63	...	236	
Undiagnosed ...	3	8	...	11	...	73	
Old cases or subsequent attendances from vari- ous out-stations } before new form came into use.							
Total ...	112	3,269	220	3,381	138	53,270	11

TABLE VIII.

(a) LIST OF SURGICAL OPERATIONS PERFORMED IN CONNAUGHT HOSPITAL IN 1924.

Nature of Operation.				Number.	Cured.	Relieved.	Unrelieved.	Died.
Congenital occlusion of penis	...	...	...	1	1			
Strangulated hernia	...	...	...	7	6	...	...	1
Herniotomy	...	...	...	6	6			
Fibroma of lip removed	...	...	...	1	1			
Enchondroma of hand removed	...	...	...	1	1			
Sequestrotomy	...	...	...	1	1			
Amputations	...	...	...	7	7			
Multiple fibromata removed	...	...	...	1	1			
Larparotomy	...	...	...	1	...	1		
Tumour of jaw removed	...	...	...	2	2			
Complete rupture of perinæum	...	...	...	1	1			
Removal of foreign bodies	...	...	...	1	1			
Removal of elephantiasis	...	...	...	6	6			
Sarcoma of Scapula	...	...	...	1	...	...	1	
Necrosis of finger	...	...	...	2	2			
Urethral stricture	...	...	...	1	...	1		
Empyema	...	...	...	1	1			
Harelip	...	...	...	1	...	...	1	
Reduction of dislocation	...	...	...	1	1			
Incomplete abortion	...	...	...	2	2			
Removal of lipomata	...	...	...	2	2			
Liver abscess	...	...	...	1	1			
Excision of cyst of neck	...	...	...	2	2			
Removal of uterine tumour	..	...	...	1	...	1		
Circumcision	...	...	...	1	1			
Fæcal fistula	...	...	...	1	1			
Total	...	...	...	53	47	3	2	1

(b) LIST OF SURGICAL OPERATIONS PERFORMED IN EUROPEAN HOSPITAL IN 1924.

Nature of Operation.				Total Number.	Cured.	Relieved.	Unrelieved.	Died.
Tonsillectomy	...	...	...	1	1			
Amputation of finger	...	...	...	1	1			
Minor operations, incisions	...	...	...	10	10			
Total	...	...	...	12	12			

(c) SURGICAL OPERATIONS PERFORMED ELSEWHERE, REPORTED BY MEDICAL OFFICERS.

Nature of Operation.				Number.	Cured.	Relieved.	Unrelieved.	Died.
Port Lokko	...	...	...	3	3			
Daru	...	...	...	64	50	9	3	2
Kennema	...	...	...	10	8	...	...	2
Bonthe	...	...	...	21	11	9	...	1
Moyamba	...	...	...	1	1			
Bo	...	...	...	43	40	2	...	1
Pujehun	...	...	...	2	2			
Makeni	...	...	...	4	4			
Prisons	...	...	...	1	1			
Kissy	...	...	...	44	44			
Total	...	...	...	193	164	20	3	6

APPENDICES.

I—CONNAUGHT HOSPITAL LABORATORY REPORT.

During the year 2,258 specimens were sent for examination.

NURSING HOME AND CONNAUGHT HOSPITAL.

Blood Infection.—Six hundred and forty-four samples were examined, chiefly from cases of suspected malaria. Plasmodium falciparum was found on 173 occasions, plasmodium vivax accounted for twelve cases and plasmodium malarie for nine.

Malaria was specially prevalent during the months of April, May and June, and during this period only were sexual forms of plasmodium falciparum found in films from adult natives.

Of the blood microfilariæ, filaria bancrofti was found on seven and filaria loa on four occasions.

Chemical, microscopical or spectroscopical examinations were made of 267 specimens of urine.

One hundred and thirty specimens of sputum were examined, in thirty-one of which B. tuberculosis was found. This bears out our clinical observation that tuberculosis is increasing in Freetown.

Forty-six specimens of pus, chiefly from cases of venereal disease, were examined.

Three cases of leprosy were diagnosed from microscopic findings during the year.

Helminthic Infection.—The high percentage of specimens showing infection with ova or larvæ of various helminths is still maintained, the most common parasite being ascaris lumbricoides. Slightly less common are ankylostomidæ followed by trichuris trichiura, strongyloides stercoralis and tæniidæ. Oxyuris vermicularis is very uncommon.

Five hundred and three specimens of fæces were examined.

Ova of ascaris lumbricoides were found on	...	...	174 occasions
Ova of ankylostoma were found on	...	...	93 „
Larvæ of strongyloides stercoralis were found on	...	...	48 „
Ova of trichuris trichiura were found on	...	...	27 „
Ova of tæniidæ (all T. saginata) were found on	...	...	19 „
Adult oxyuris vermicularis were found on	...	...	2 „

Many of the cases show infection with more than one parasite, the most common association being ascaris with ankylostoma. Two cases had infection with four different varieties of ova.

Entamœba histolytica, either encysted or in free forms, was found on thirty-eight occasions.

Of the non-pathogenic amœbæ, entamœba coli is most commonly found followed by iodamœba butschlii and endolinax nana.

Of the intestinal flagellates, lamblia intestinalis is found most frequently, in the majority of cases, associated with clinical dysentery.

During the year ten post-mortem examinations were made. The cause of death in each of these cases is shown in the following table:—

Cause of Death.				Number of Cases.
Rupture of dysenteric ulcer, general peritonitis	...	...	...	1
Rupture of aneurysm of ascending aorta	...	...	...	1
Acute lobar pneumonia	...	...	...	2
Valvular disease of the heart-myocardial degeneration	...	...	...	1
Drowning	...	...	...	2
Intestinal obstruction, general peritonitis	...	...	...	1
Cerebral hæmorrhage	...	...	...	1
Rupture of small intestine, general peritonitis	...	...	...	1
Total	...	...	...	10

The new mortuary built in the hospital grounds is now complete and in use.

Miscellaneous.—In conjunction with Mr. Herd of the Sanitary Department a daily examination has been made on rats caught in different localities in Freetown. Smears from the spleen and glands are made from each animal and so far no infection from *B. pestis* has been found.

Cases of poisoning from impurities present in carbon tetrachloride have been recently reported from various countries. Periodical chemical tests of samples of this drug from the dispensary have been made to detect the presence of carbon bisulphide.

Samples so far examined have been free from this impurity and no ill effects have been seen from the use of this drug in the wards. The usual dose employed is one dram repeated after one day's interval.

Several slides from suspected cases of anthrax in cattle were examined.

Sections of several tumours were made for purposes of diagnosis.

FREETOWN PRISON.

Blood Infection.—One hundred and five films were sent for examination. *Plasmodium falciparum* was found on twenty-seven occasions. No cases of infection with *plasmodium vivax* or *plasmodium malariae* were seen during the year. In two slides *filaria bancrofti* were seen.

Special examination was made of urine from three cases of schistosomiasis. No *B. tuberculosis* was found in four specimens submitted for examination.

Helminthic Infection.—Five hundred and fifty specimens of faeces were examined. Of these 227 were found to contain one or more varieties of helminthic ova.

Ova of <i>ascaris lumbricoides</i> were found on	...	...	99 occasions
Ova of <i>ankylostomidae</i> were found on	...	...	92 „
Larvæ of <i>strongyloides stercoralis</i> were found on	...	...	37 „
Ova of <i>trichuris trichinra</i> were found on	...	...	12 „
Ova of <i>tæniidae</i> (all <i>T. saginata</i>) were found on	...	...	20 „
<i>Entamoeba histolitica</i> was found in	...	...	14 cases

J. D. DIMOCK,

Medical Officer in charge of Laboratory.

II—REPORT ON THE MATERNITY WARD, WITH NOTES ON A CASE OF TETANUS NEOMATORUM RESULTING IN RECOVERY.

During the year 263 patients were admitted to the maternity ward of the Connaught Hospital: 172 were delivered in the ward, eighty-seven had complicated pregnancies and four were admitted during the puerperium.

There were four deaths among the 172 labour cases and 185 children were delivered in the hospital, there being fourteen cases of twins, one of the twins being delivered at home. Of these children, eleven were dead-born, six still-born and fifteen died after birth.

There were forty-one abnormal labours among fifty-eight primiparæ and 114 multiparæ—each set showed 24 per cent. of abnormal cases.

The abnormal cases were made up as follows:—

Forceps	...	...	...	2	(one a flat pelvis)
Ante-partum eclampsia	...	...	...	1	
Pre-eclampsia	...	...	...	1	
Eclampsia	...	...	...	3	(all treated with morphia)
Premature rupture of membranes	...	...	...	1	
Premature labour	...	...	...	6	
Pernicious vomiting	...	...	...	1	(premature birth)
Breech	...	...	...	3	
Septicæmia	...	...	...	1	
Dead births	...	...	...	2	
Twins	...	...	...	14	
Torn perinæum	...	...	...	2	
Placenta prævia	...	...	...	3	(all treated by podalic version,
Accidental hæmorrhage	...	...	...	1	

The four maternal deaths among the labour cases were:—

- (1) Pernicious vomiting; exhaustion after spontaneous delivery of premature twins.
- (2) Persistent occipito posterior; protracted labour; forceps extraction; puerperal insanity; collapse.
- (3) Ante-partum eclampsia; delivered spontaneously; died comatose.
- (4) Ante-partum eclampsia; low forceps; died comatose.

The thirty-two lost children consisted of the following:—

DEAD BIRTHS.	STILL-BIRTHS.	DEATHS.
1. Placenta prævia Podalic version	1. Placenta prævia twins— one lost	{ 1. Premature twins 2. died after a few minutes
2. Placenta prævia Podalic version	2. Flat pelvis-forceps	3. Premature—lived one hour
3. Breech-swollen face showed that podalic version had been performed before admission	3. Maternal malaria pre- mature labour	4. Premature—lived 15 hours
4. Ante-partum eclamp- sia	4. Breech-extended arms and legs	5. Atelectasis—lived one hour
5. Accidental hæmor- rhage	5. Persistent occipito post. Forceps	6. Atelectasis—lived three days
6. Eclampsia	6. Twins—of which one was lost	7. Premature rupture of mem- branes; protracted labour
7. Premature		8. Normal labour—lived two days
8. Premature		9. A premature twin
9. No apparent reason		10. Premature—lived 10 minutes
10. No apparent reason		11. Died three days after delivery
11. One twin macerated		{ 12. Premature twins—one lived ten minutes 13. The other three and a-half hours
		14. One twin died after sixteen hours
		15. Lived two days

The term “dead-born” is used in this report to designate a child that was obviously not lost in the birth but had been dead “in utero” sometime as evidenced by skin peeling and discolouration of the cord.

The morbidity rate for the maternity cases cannot be given, as the average stay in hospital of each patient was only 6·2 days. The frequency of twin pregnancy is very great, during the year under review 8 per cent. of all cases were twins.

Of all cases admitted to the labour ward between 1919 and 1923, i.e. five years, 6 per cent. were twins, whereas the recognized normal percentage is 1·25 per cent.; bearing in mind the increased mortality amongst twins, this fact has to be taken into account when interpreting the infant mortality rate here.

The toxæmias—viz. pre-eclamptic state, albuminuria of pregnancy, eclampsia and pernicious vomiting are another menace to the infant. There were fifteen such cases this year. I have noticed a seasonal incidence of eclampsia and have prepared a graph which illustrates the point. It will be seen that the season at which this disease reaches its height is the wettest and coldest.

The attached graph is prepared from:—

- (1) All the eclamptic cases (exhibiting fits), twenty-three in number, that have been admitted to the Connaught Hospital between 1919 and 1924.
- (2) The temperature curve is for Freetown, 1923.
- (3) The rainfall—the average monthly for the last forty years.

Of the twenty-three eclamptics (1919–1924) four died. They gave birth to twenty-six children, there being three pairs of twins; only nine of these children survived birth.

Of the six twin children two died. All the cases were given the morphia treatment. The total dosage of morphia not exceeding two grains.

The number of cases represented graphically is very small, but it represents a period of five years and confirms the observation regarding the seasonal incidence of eclampsia and pre-eclampsia. It should be noted that the cases of pre-eclampsia are not graphed as they mostly come under the heading “complications of pregnancy.”

The eighty-seven complicated pregnancies were made up as follows:—

Observation and false pain	...	...	...	...	26
Complete abortion	...	...	...	...	9
Incomplete abortion	...	...	...	...	5
Threatened abortion	...	...	...	...	4
Threatened miscarriage	...	...	...	...	1
Malaria	...	...	...	...	10
Pre-eclampsia	...	...	...	...	7
Pneumonia	...	...	...	...	3
Albuminuria	...	...	...	...	2
Pyrexia (undiagnosed)	...	...	...	...	2
Accidental hæmorrhage	...	...	...	...	2
Undiagnosed	...	...	...	...	3
Bronchitis	...	...	...	...	2
Retained placenta (incomplete miscarriage)	...	...	...	...	1
Placenta prævia	...	...	...	...	1
Septicæmia	...	...	...	...	1
Ascariasis	...	...	...	...	1
Vulvitis	...	...	...	...	1
Cardiac disease	...	...	...	...	1
Mastitis	...	...	...	...	1
Coryza	...	...	...	...	1
Peritonitis	...	...	...	...	1
Retroversion of uterus	...	...	...	...	1
Fibroid uterus	...	...	...	...	1
Total	...	...	...	...	87

There were three deaths amongst the eighty-seven complicated pregnancies:—

- (1) Pernicious vomiting complicated by ascariasis.
- (2) Septicæmia—died undelivered shortly after admission.
- (3) Ante-partum eclampsia—died undelivered shortly after admission.

During the year the Sir Alfred Jones Laboratory examined eighty placentas sent from the maternity ward of the Connaught Hospital, together with peripheral blood films of the mothers and children. Twenty-six of these placentas proved to be infected with M.T. malarial parasites and were associated with nine foetal and infant deaths—35 per cent. deaths. The remaining fifty-four non-infected placentas were associated with eight such deaths—15 per cent.

These figures suggest that malaria is responsible for a large proportion of the foetal and infant deaths, but the nine children lost and associated with malarial infection were.—

- (1) Premature twins—twenty-six weeks; no maternal pyrexia twenty-one hours before delivery or for four days after, when mother discharged herself from hospital: both twins died within four hours of birth.
- (2) Full time twins; no maternal pyrexia; mother in hospital with dyspeptic symptoms and feeling of weight in epigastrium fifteen days before delivery. First twin dead-born, second discharged in good condition nine days old.
- (3) Full time twins. Both delivered living on day of admission. Maternal temperature 100 degrees Fahrenheit eight hours after delivery. First child died after sixteen hours, second child left hospital well on third day.
- (4) Full time. Delivered on fourth day of mother's stay in hospital. Maternal temperature rose to 100 degrees Fahrenheit on second and third days of stay. Premature rupture of membranes. Infant died one hour after delivery. Mother left hospital on the sixth day of uneventful puerperium.
- (5) Mother seen during pregnancy—neglected malaria—pyrexia frequently. Premature labour; death of child after fifteen hours.
- (6) Neglected maternal malaria, pyrexia. Delayed coming to hospital after advice. Dead-born child.
- (7) Normal apyrexial delivery; child died after two days. Mother had no fever during four days of puerperium spent in hospital.
- (8) Normal apyrexial delivery; full time; eight and a-half pounds child; still-born; temperature 100 degrees Fahrenheit on day of delivery. On third day discharged herself from hospital.

It will be seen from this that four of the nine children lost were twins: this factor alone doubles their mortality rate. Another was lost through an accident, i.e. premature rupture of membranes. Two more were associated with high fever due to neglected malaria and the remaining two were perhaps influenced by the chronic malaria alone.

Although twenty-six of the eighty placentas were infected with the M.T. parasite, only seven of the mothers (six of them having positive placentæ) showed the parasite in their peripheral blood and not one of the babies.

As it seems probable that the peripheral blood rarely shows parasites without a heavier placental infection, I give a few notes about each of the seven cases, as far as possible giving the fate of the child. To-day in the notes refers to 28th February, 1925.

17th July, 1924.—Mrs. N. T., admitted 17th and left 21st July. Temperature never exceeded 100 degrees Fahrenheit. Baby weighed 8 lb. and was discharged healthy four days old. During November, mother and child apparently quite well—left Colony for Monrovia.

6th August, 1924.—Mrs. D. T., admitted 6th and left 17th August. Temperature 102 degrees Fahrenheit on admission, two hours after which she delivered. Rose to 101 degrees Fahrenheit on the following day, after which it remained between normal and ninety-nine degrees Fahrenheit. Child weighed 7 lb. Discharged healthy eleven days old, weighing 7 lb. Subsequently, ten blood examinations of child made in July, August, September and November were negative. Weighed 15 lb. on 14th November, 1924, and is well to-day.

7th August, 1924.—Mrs. S. S., admitted 7th and discharged 11th August. Baby weighed 7 lb. at birth—left hospital apparently well. Baby was examined to-day and found apparently well.

7th September, 1924.—Mrs. N. G., admitted 7th and left 11th September. Premature child weighed 5 lb. Discharged living four days old. During November mother and child left the Colony and travelled to Monrovia.

20th November, 1924.—Mrs. H. G., admitted 20th and left 25th November. Mother treated for pulmonary tuberculosis (T.B. found in sputum) with pneumosan injections during first six months of pregnancy. Full term child, 6 lb. Discharged living and still well to date. No parasites found on examination when seven weeks old, 29th January, 1925.

23rd November, 1924.—Mrs. M. J., admitted 23rd and left 24th November. Apyrexial delivery. Full time child—weighed $7\frac{3}{4}$ lb. and discharged alive, is still living and well.

5th December, 1924.—Mrs. M., admitted 5th and left 8th December. Apyrexial delivery. Full time child, 6 lb.—died on second day.

Although the number of cases examined (eighty) is small, the percentage of positive cases—32 per cent.—is so great that I think it worth while to draw some conclusions from these cases examined.

After carefully considering all these results, and remembering that we are only dealing with the last three months of pregnancy, I cannot find any definite evidence that the infection of the placenta prejudices the chance of the foetus being born alive and living at least during the first few months as indicated above. There is no evidence that the presence of the malarial parasite in the peripheral blood of the mother prejudices the chances of the foetus surviving, for six out of seven mothers, with both placental and peripheral blood infection, had apparently healthy living children. It seems that the factor that determines whether the chance of the foetus surviving birth will be seriously prejudiced or not by the malarial parasite (M.T.) is pyrexia. A heavy placental infection without pyrexia can be harmless to the foetus.

Does the ante-natal dosing of toxin confer a temporary relative immunity on the child, helping it to combat the infection that it is surely going to get in early infancy? I do not wish to give the impression that I am belittling the danger of malaria to the pregnant woman and her offspring, but would point out that all the patients dealt with in this series are Africans, with the exception of one Spaniard, and that they have to rely chiefly on their acquired relative immunity in order to continue to exist in their malarious climate.

In conclusion, I would suggest that in order to lower foetal and infantile death-rate associated with maternal malaria, mothers should be taught to regard pyrexia as a complication of pregnancy requiring immediate treatment. In this way all the malarial cases requiring treatment would be brought under observation and control. Quinine is tolerably safe and efficacious in these cases and the risk of depriving the unborn child of its possible acquired relative temporary immunity by injudicious dosing of the mother with quinine would be avoided. The children born of the cases requiring treatment would have been exposed to at least the effects of one outburst of malaria and many of the others to the effects of a chronic infection.

E. J. WRIGHT,
Medical Officer in Charge of Maternity Ward.

A CASE OF TETANUS NEONATORUM WITH RECOVERY.

Baby T., female, born at 8.30 a.m. on 17th October, apparently healthy and weighing $7\frac{1}{2}$ lb. showed signs of inflammation of the umbilicus on 21st October.

On 23rd October, at 9 a.m., when six days old, showed all the signs and symptoms of tetanus. Trismus, spasticity, frequent spasms aggravated by noise and movement, inability to suckle.

Immediately the condition was recognized she was given 6,000 units of anti-tetanic serum—half subcutaneously and the remainder intra-muscularly. The umbilical cord was dressed with carbolic fomentations; no drugs administered.

At 4 p.m. the same day the spasms ceased—jaw remained stiff and limbs spastic.

24th October, 1924.—A further 6,000 units were administered. Spasticity continued but no spasms.

25th October, 1924.—Spasticity less.

26th October, 1924.—Spasticity still improving—child able to suckle.

27th October, 1924.—Child practically well, mother left hospital against advice not realizing how ill her infant had really been.

E. J. WRIGHT.

III—FREETOWN PRISON REPORT.

Dr. Dowdall, Senior Medical Officer, was in charge until the 23rd of July when Dr. J. Y. Wood took over.

Health of European Staff.—Good.

Health of African Staff.—Fairly good. Forty-seven were treated, nineteen placed on the sick list for short periods, thirteen sent to the Connaught Hospital, two died, one from pneumonia, the other from wounds inflicted by a prisoner. One was invalided for tuberculosis.

Health of Prisoners.—The health of the prisoners was exceptionally satisfactory; no outbreak of any kind. Beri-beri seems at last to have been stamped out. There were ten deaths from various causes, but of these nine took place during the first half of the rainy season, viz. April to July. No death took place after the 5th August to the end of the year. The causes of death are shown in the statistical report. Six prisoners were sent to the Kissy Asylum under emergency certificate.

Chief Diseases.—The chief diseases treated were malaria, bronchitis, digestive disturbances and skin diseases. There was one case of measles but, fortunately, this was discovered early and the measures taken prevented any spread.

Malaria.—One hundred and thirty-nine cases as against 169 in 1923 and 304 in 1922.

Amœbic Dysentery.—This was still further reduced. Nine cases were treated, chiefly newcomers, with one death. In addition there were nine of undetermined type.

Beri-beri.—None.

Leprosy.—None. The case reported in last annual report as cured remained in perfect health during the year—engaged in gardening.

Bilharziasis.—None.

Filariasis.—One case of loa loa.

Tænia Saginata.—Twenty-four cases were treated.

Ankylostome Infection.—During the latter part of the year routine weekly treatment of prisoners shown to be infected with ankylostomes was resumed. Fifty cases were treated. Eucalyptus treatment has now been abandoned. Oil of Chenopodium in combination with carbon tetrachloride was tried, but tymol-beta-naphthol still remains the best treatment as shown by results.

Syphilis.—In the absence of opportunity for obtaining Wasserman or other definite diagnostic tests, cases were treated during the latter half of the year on suspicion and reaction or marked improvement accepted as indicating further treatment. Two cases

were treated early in the year. Analysis of the drugs used, chiefly intravenous but a few intramuscular shows:—

Galyl or novarsenobillon for syphilis ...	...	31 cases, exclusive of 2 African staff
„ „ chronic malaria ...	...	4 cases
„ „ ascites ...	...	1 case (failure)
Starbilarisan (Boots) for syphilis ...	...	7 cases
Bismutol (obtained at the end of the year) syphilis (nervous) 1 case.		

The best and most marked results were given by Galyl, and next to this Novarsenobillon. Starbilarisan is very convenient, easier to give, milder in its effect, but requires more prolonged treatment.

One morning weekly is given up to anti-syphilitic treatment.

The number attending the out-patients dispensary is no criterion of the general health of the prisoners as they are encouraged to attend for the most minor complaints with a view to preventing serious diseases and to maintain their efficiency as workers. Coryza and influenzal colds, and common intestinal troubles, viz. constipation, colic, diarrhœa and dyspepsia, account for one-third of the whole of the new cases (401 out of 1,219) and for nearly one-third of the subsequent attendances.

The change in the hospital is most marked to one who has had this branch under observation for a number of years. The main ward is now seldom occupied except for the weekly ankylostome treatments and for those under observation following intravenous anti-syphilitic treatment. Considering the class from which the majority of the prisoners are drawn, the steady routine work in clearing up dysentery, ankylostomiasis and syphilis should have an excellent result on the general population of the town. The two observation wards and the block of observation cells are used for any prisoner who shows the least rise of temperature or who reports diarrhœa or the passing of blood in the fæces.

Now that serious diseases have been brought under control special attention is being directed to the debilitating effect of skin diseases and the most thorough steps taken to clear this up. An analysis of the admissions to prison during the second half of the year shows:—

Scabies ...	...	...	...	...	...	64
Tinea and scabies ...	...	...	...	...	...	8
Eczema ...	...	...	...	...	...	8
Tinea ...	...	...	...	...	...	24
Craw-craw ...	...	...	...	...	...	6
Total ...						<u>110</u>

As was to be expected, work in the small garden established just outside the prison walls and the anti-tsetse work at the Cape Sanitary Station, where a gang of prisoners was maintained till 18th September, when the station was required for quarantine purposes, contributed very largely to the excellent health of the prisoners.

Operations.—One major operation was performed during the year—Laparotomy—and sixty-nine minor operations. The daily average number of sick in hospital was six. The death-rate per 1,000 daily average strength was thirty-eight. The sanitary condition of the prison remained satisfactory throughout the year.

The prison was visited by His Excellency the Governor and the Honourable the Director of Medical and Sanitary Services.

STATISTICAL RETURN, FREETOWN PRISON.

In-patients in hospital at the end of December, 1923 ...	...	1
Admitted during the year ...	...	<u>187</u>
Total ...		<u>188</u>

	March Quarter.	June Quarter.	September Quarter.	December Quarter.	Total.
Admissions ...	18	45	48	76	187
Cured ...	8	22	22	45	97
Relieved ...	3	20	18	39	80
Unrelieved ...	...	...	1	...	1
Died ...	1	6	3	...	10
Under observation and treatment ...	...	...	...	...	159

Deaths.—Causes as follows:—

Tetanus	...	...	...	...	...	...	1
Bright disease	...	...	...	...	...	...	1
Chronic heart disease	...	...	...	...	...	...	1
Pulmonary tuberculosis	...	...	...	...	...	...	1
Heart failure following amœbic dysentery	...	...	...	...	...	...	1
Heart failure following paralysis	...	...	...	...	...	...	1
Heart failure following cerebral hæmorrhage	...	...	...	...	...	...	1
Hyperpyrexia following acute pneumonia	...	...	...	...	...	...	1
Epilepsy following locomotor ataxia	...	...	...	...	...	...	1
Chronic splenitis following enlarged liver, etc.	...	...	...	...	...	...	1

OUT-PATIENTS.

				New Cases.	Subsequent Attendances.
March Quarter	...	...	...	293	482
June Quarter	...	...	...	274	501
September Quarter	...	...	...	366	523
December Quarter	...	...	...	286	433
Total	...	...	...	1,219	1,939

Daily average number of prisoners:—

Males	...	...	...	...	...	...	257
Females	...	...	...	...	...	...	2
Total							259

Average weight of prisoners, 132 lb.

_____	Number of New-comers Examined.	Remands and Trials Examined.	Examined as to Fitness for		Executions.
			Solitary Confinement.	Corporal Punishment.	
March Quarter	227	96	56	4	...
June Quarter	241	63	49	3	1
September Quarter	282	117	63	5	...
December Quarter	272	96	78	4	1

JOHN Y. WOOD,
Medical Officer in Charge of Prison.

IV—INFANT WELFARE IN FREETOWN.

The clinic was started on 22nd February, 1924, and has been one of the important features in the campaign against infantile mortality.

It has been held weekly on Friday afternoons at 2 o'clock in the out-patients department of the Connaught Hospital.

Every child attending was weighed, then seen by the medical officer and given any necessary treatment or advice; the infant was then passed on to an officer from the Sir Alfred Jones Research Laboratory to have blood films taken for microscopical examination. The routine examination of the blood was started on 18th July.

Since the start in February, there have been forty-two clinics with a total attendance of 1,400, which gives an average attendance of thirty-three at each clinic.

There are 512 individuals on the register giving an average attendance per baby of 2·7.

Eight hundred and sixty-three specimens of blood were examined by the Sir Alfred Jones Research Laboratory and in 159 cases, i.e. 18 per cent., the malarial parasite was found. These 863 specimens were obtained from 295 individuals, eighty-seven of them showing the malarial parasite in their blood, i.e. 29.5 per cent.

The whole of the Infant Welfare work has been carried on at this clinic, which has been supplied with infants from the central, east and west wards of the town, which districts Nurse B. O. W. Cole has been visiting daily throughout the year.

Every week she was given a list of the births registered, every one of which she made it a duty to visit first. In the appended table these visits are shown under "newly born." Having dealt with these cases, she visited any young children (under three years) in the locality of her work, these are styled new cases in the list. Repeated visits refer to subsequent visits to the newly born and new cases.

The following table shows the number and kind of visits paid by Miss Cole during the year:—

					Newly Born.	New Cases.	Repeated Visits.
January	...	...	...	...	40	270	—
February	...	...	...	...	52	138	122
March	...	...	...	...	53	122	88
April	...	...	...	...	85	60	85
May	...	...	...	...	39	87	159
June	...	...	...	...	36	72	142
July	...	...	...	...	62	192	37
August	...	...	...	...	32	35	191
September	...	...	...	...	32	28	252
October	...	...	...	...	37	27	214
November	...	...	...	...	32	30	156
December	...	...	...	...	43	32	216

The falling off of new cases in the last five months of the year is probably due to the new cases having been rounded up during the first six months of the year.

I think the following remarks in Nurse Cole's report of the year's work are worth recording:—

- (1) Many parturient women in Freetown use their friends, relatives or midwives homes for confinement and are therefore difficult to trace.
- (2) There are still many unregistered births.
- (3) The suspicion of the country mothers—Limba, Temne, Mende, etc., about the object of her visits was allayed by the year's end. At first they hid their babies.
- (4) The majority of infants seen were breast-fed entirely till about the fourth month and partly until the eighteenth to twenty-fourth month.
- (5) Nearly all are given agbo—a concoction of herbs.
- (6) Supplementary feeds usually consist of ogie, corn flour, rice flour, arrowroot, oatmeal and foofoo.
- (7) Goat's milk is used to some extent with success.

It was my experience to find in the Infant Welfare Clinic that foofoo pap was given by the Krus to their children at a very early age, as early as two months in some cases. The Creoles use ogie more frequently. Foofoo is prepared from cassada in the following manner:—

"The tuber is washed and peeled then placed in water for two to three days after which it is grated, wrapped in leaves and placed in a basket with a weight on it. After two to three days it is made into balls and sold."

The usual method of preparing the pap, so commonly used by the Krus for their infants, is as follows:—

The ball of foofoo, to last a week, is pounded, washed and strained, the clean foofoo placed in a basin and filled with water and left overnight. The water is decanted and the desired quantity of clean macerated foofoo removed to make pap. The basin with remaining clean macerated foofoo is again filled with water and ready for use, and every time some foofoo is removed the water is changed. The last foofoo used has been macerated seven days with many changes of water. Ogie is corn ground and water added—it is supposed to keep better than the undried ground corn.

It is impossible to give a detailed analysis of the cases seen at the clinic, because the attendances were very irregular as indicated by the average attendance, 2·7, the same child often being brought at odd intervals with different complaints.

Malaria was undoubtedly the most common disease among them, as is shown by the results of the blood examinations and by frequent manifestations of the signs of anæmia, enlarged spleen and pyrexia.

Cases as ascariasis, pertusis, rickets, scabies, aphthous stomatitis were commonly seen, but constipation, cough, marasmus and diarrhœa were also frequent complaints.

Three typical cases of congenital syphilis were observed but not efficiently treated, owing to the erratic attendance of the mothers, one of these cases receive a course of sulfarsenol injections and benefited greatly.

Several suspicious cases of syphilis were seen with marked snuffles and wasting. There was one case of acute hydrocephalus with micro opthalmia.

The general health of the children was poor, many of them requiring hospital treatment.

There is great need for a children's ward attached to the Connaught Hospital capable of accommodating twenty children.

E. J. WRIGHT,

Medical Officer in Charge of Infant Welfare.

V—NOTES ON A MOSQUITO SURVEY AT DARU, SIERRA LEONE.*

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I—INTRODUCTION.

This survey was carried out during the period 17th to 28th September, 1924, that is, at the end of the rainy season. The maximum temperature recorded during this period was eighty-three degrees, and the minimum sixty-nine degrees, Fahrenheit.

The investigation was primarily directed to the discovery of mosquito, especially anopheline breeding places, and secondarily to evolving methods by which the breeding places could be eradicated or controlled. Questions of general sanitation, e.g. water supply, housing, conservancy and refuse disposal, were also gone into as far as was possible in the limited time available, but are omitted from this extract from the original report.

II—DESCRIPTION OF THE CANTONMENT.

The cantonment is situated on slightly raised ground on the right bank of the river Moa. There are two sets of officers' quarters with the officers' mess situated between them (*see map*). One set of the officers' quarters and both the Headquarters and A Company lines face the river Moa, the other set is situated higher up above the valley from the hospital to Swamp A. Just above the barracks is the railway bridge over the river, and beyond the bridge at a distance from it of about 200 yards is a creek which forms the outlet into the river of the swamp marked "A" in the plan. Some distance below the barracks is a second creek which forms the outlet into the river of the swamp marked "B" in the plan. The two swamps "A" and "B" arise at a common watershed situated behind the barracks and pass above and below it, skirting it to reach the river. The barracks are therefore almost completely encircled by river and swamp. It will be seen later that certain streams which are feeders of these swamps and of the river arise actually in the barracks grounds.

At the time of this examination, the river Moa had arisen and overflowed its banks in front of the officers' quarters and parts of the men's lines; the level reached by the water was stated to be higher than it had been during the previous eight years. The rise in the river level was accompanied by a corresponding rise in the level of the water in both the swamps "A" and "B" and in their branches and feeder streams. It was at once evident that if anopheline mosquitoes were breeding at the edges of the river and swamps, the process of flooding must inevitably bring them into much closer proximity to the houses, especially to those occupied by the officers.

*These notes form part of a report presented to the Government of Sierra Leone,

III—Mosquito-SURVEY.

A. *Breeding places.* (i) *Mosquito Traps.*—Twenty-seven water traps were put down in various sites in the camp, but of these five were discarded owing to accidents. Twenty-two remained; of these twenty-two, there were nine, that is 41 per cent. which had mosquitoes breeding in them. Of these nine, eight contained only culicine larvæ, while one contained both culicine and anopheline larvæ; in several cases larvæ belonging to different broods were present in the same trap. While this experiment demonstrated the very general prevalence of mosquitoes around and in the barracks grounds, it proved in the end of only confirmatory value, because while it was in progress, the direct discovery of breeding places had already revealed a somewhat disturbing state of affairs. The condition of the river Moa and of swamps "A" and "B" was studied in detail.

(ii) *The Moa River.*—The bank of the river was examined from the creek above the railway bridge down to the creek beyond A Company lines. For the sake of clearness in description this stretch may be divided into sections.

Section I extends from the creek above the railway down to the bridge. The bank was several feet high in parts of this section, but in other parts it sloped gradually down to the water; in all this section it was covered with thin bush or coarse grass. Along the edge anopheline larvæ and pupæ were found in fair numbers.

Section II extends from the railway bridge to the end of the area occupied by the officers' quarters. Along this section the bank was grass covered and sloped gently down to the water's edges. In the margin of the river throughout this section anopheline larvæ and pupæ were numerous.

Section III extends along the front of headquarters lines. In this area the river bank is high, being eight to twelve feet above the water; the water runs along bare soil with no shelter for mosquito breeding purposes. No anopheline larvæ or pupæ were found here.

Section IV extends along the front of A company lines. This area has banks which slope gradually down to the water's edge; in this respect it resembles closely section II. No anopheline larvæ or pupæ were found here. The reason for this appears to be that in this section opposite A Company lines, the bank had been completely denuded of grass and weeds. This simple alteration in the character of the bank is apparently responsible for the important difference in anopheline breeding. Thus the river's edge in section II, yielded on the 17th September over 150 anopheline larvæ and pupæ, while the river's edge in section IV on the same date yielded none.

Section V extends from the far end of A Company lines at the end of the barracks ground to the creek below. The bank here was bushy and flat, and larvæ and pupæ of anophelines were present in fair numbers.

If we turn attention more particularly to the three sections which lie immediately opposite the barracks we note several points of interest. Section II for example, grass covered and with a gentle slope affords excellent breeding shelter for anophelines when the water in the river is low; as the water rises the gentle slope of the ground permits the water to encroach nearer to the officer's quarters, and as it rises it brings with it the larvæ and pupæ already bred in it; in addition, it forms grassy pools in which both anophelines and culicines lay their eggs. Section III has steep banks and when the water is low it affords little shelter for anopheline breeding. Even when the water rises it is still confined by the bank and no breeding places are formed.

A factor which has a secondary influence in sections II and III arises out of the configuration of the river at these points. The bank of section II is concave towards the river while that of section III is convex. The result is that the water which spreads out and is sluggish in flow at the edge of section II is restricted and more rapid in flow along the edge of section III.

Section IV, of which the bank is sloping but bare, affords no shelter for anopheline breeding. Hence when the water rises here it does not bring with it larvæ and pupæ. Furthermore, as the whole of the bank even above high water mark is bare, no grassy pools are left in which anophelines and culicines can breed when the river recedes.

The detailed study of these three sections, therefore, reveals important factors bearing on the bionomics of the river bank anophelines. It will be observed that advantage can be taken of the information so obtained in such a way as to eliminate anopheline breeding places in those sections where they are at present found. The remedial measures which may be used to accomplish this most economically will be discussed later.

There are several additional facts which must be taken into account while dealing with the river.

(a) *Tributary Streams*.—Several small irregular water courses, partly from springs, partly from surface drainage, run down to the river from the higher ground upon which the barracks are situated. One of these deserves special attention. It is that stream which lies between headquarters lines and A company lines. This stream has clear water derived from a spring on the high ground; it has in it and at its edges a considerable quantity of grass and weed. As it passes down it spreads out on approaching the river, and in this part it is heavily fringed with grass. In the lower part of this stream anopheline larvæ were found.

(b) *Fallen Trees*.—Along the edge of the river several trees have fallen into the water; many of these have large holes in them which the river water fills when the river is high. Owing to the excessive height of the water at the time of this visit the holes were flooded out by the river. It is more than probable, however, that as the river recedes the holes which retain water, many of them of large size, will act as breeding places for mosquitoes.

(c) *Rocks*.—I am informed that as the river falls a reef of rocks is exposed in the centre of the river, and that rocky pools are left in large numbers. It is almost certain that these pools will breed mosquitoes.

(iii) *Swamp A*.—This swamp was followed from the mouth of the creek by which it enters the river above the railway bridge to its source behind the barracks at the back of Boma town; anopheline and culicine larvæ and pupæ were found in large numbers along its whole length. The character of the swamp changes as it passes up towards its commencement. Where it lies on the far side of the railway it is deep and has strong bush growing along its margins. Soon after crossing under the railway it becomes shallower and in its upper part it is covered with a matting of coarse grass. It was possible at this point to walk over it, but each step left a pool of water from which larvæ and pupæ of anophelines were almost invariably recovered.

The Hospital Drain.—In passing upwards along the swamp A from the creek it was observed that a drain leading from the hospital joined it by passing under the railway. It was found that the ground just inside the railway on the way to the hospital was marshy, and that in this marshy ground anophelines as well as culicines were breeding.

The drain from the hospital on the high ground comes down a steep hill, and then flattens out and passes with a gradual slope in the railway embankment, under which it passes to join swamp A beyond the railway. The condition of the drain at the time of examination was as follows:—

“Owing to the rise of the swamp water the culvert under the railway was full to the top. The water of the drain had overflowed the edges and a large triangular area of ground was rendered swampy. As a result of the rise of the swamp water, therefore, the drain was no longer able to carry away the water from the hospital area. On the contrary water from the swamp had passed up along the drain to a point midway between the railway and the hospital. In the water thus carried up anopheline larvæ and pupæ were present; these came from the marshy triangular area at the railway and probably also from the swamp beyond the railway. This drain, then, as now laid, is not effective in carrying away water at times when the river is high; not only so, but it acts as an easy route by which anopheline may be brought right into the heart of the barracks grounds, to a position where they could not exist if this drain were not there. The danger of this anopheline breeding place and the drain can best be emphasized by pointing out that several officers' houses are within 100 yards on one side while the hospital and British non-commissioned officers' houses are at a similar distance on the opposite side.”

(iv) *Swamp B*.—This was followed from the creek by which it opened into the river upwards to its source beyond the rifle range. Anopheline larvæ and pupæ were found along its margin, but by no means in such large numbers as was the case in swamp A. At one point this swamp has close relationship to the barracks. Outside the barracks grounds opposite the two “barris” at the far end of the parade ground is a feeder stream which runs to swamp B. This stream is very difficult to approach owing to the dense growth of bush and grass which covers it. Yet in it within a distance of 150 yards from the nearest house in the barracks numerous anopheline larvæ and pupæ were found. This is the nearest point to which the waters of swamp B approach the barracks.

(v) MOSQUITO BREEDING IN THE BARRACKS GROUNDS:

(a) *Artificial Water Containers*.—The tanks which receive roof water were examined for larvæ and pupæ. The roof gutters of the hospital sagged in places and afforded a lodgment for water; this was also searched; in neither cases were breeding places found. A wooden mortar standing beside the river at the women's washing place contained a little water; this was seething with larvæ and pupæ of culicines. A pail of water standing

at the place where the latrine buckets are emptied contained culicine larvæ and pupæ. Apart from these two isolated and remote instances, no artificial containers were found breeding mosquitoes. The whole barracks grounds were commendably free from derelict tins, bottles and other objects capable of harbouring mosquito larvæ.

(b) *Wells*.—There is only one well situated in the mess grounds. This is about thirty feet deep and is in rock; it is disused; it contained only a few inches of water; in this culicine larvæ were found.

(c) *Trees and Shrubs*.—The large number of trees and shrubs in the ground at Daru is quite a feature of the landscape; especially in the neighbourhood of the officers' quarters and the officers' mess. While some of the trees are of economic value, by far the majority are purely æsthetic value. Although, as will be shown below, many of these form breeding places for culicine mosquitoes, it would be very unwise to adopt any panic policy with regard to them; the value of good trees for shade purposes is very considerable, and there is no necessity to take steps which may later be regretted. If the regular routine inspection and treatment which is recommended later is carried out, it should not be necessary to sacrifice a single useful or ornamental tree.

The investigation of breeding places in trees and shrubs was carried out in a systematic manner; it proved no easy task, but great assistance was obtained from natives employed. These were first of all trained in their duties; each tree and shrub was carefully examined for holes which might contain water; if such a cavity was found, a piece of native string was tied to the shrub or tree. Any which actually contained water were marked by a second string. In two days four men had marked in this way all trees and shrubs found capable of, or actually contained water. When they reported their task finished a rapid survey was first made of all unmarked trees and shrubs; in surprisingly few cases had possible breeding places been overlooked. Attention was next turned to the marked ones, and each water collection was in turn carefully examined for larvæ or pupæ of mosquitoes. In this way a large number of breeding places was discovered and each was dealt with or else marked in a permanent manner in order that it might be radically treated.

It should be observed here that no instance of anopheline breeding in such places was found. This corresponds with the results obtained by Bacot in Freetown in 1915, and also with those at present being obtained by the Sanitary Department there in their survey of trees. It is true that Bacot found one breeding place of *Anopheles costalis* in connection with a tree. This was a pool formed on the buttress root of a silk cotton tree at ground level; it was simply a pool of water lying on the unbroken bark; it would appear to be analogous to a rock pool and not an instance of a true tree-hole breeding.

In the ground of the officers' mess alone forty-two collections of water were found in holes of trees, in tree forks, in leaf axils and in shrubs. Of the forty-two collections of water thirty-three contained larvæ and pupæ of mosquitoes. Nearly two-thirds of the breeding places were in the clumps of bamboo near the tennis court. Many of these had been cut in such a way as to leave a little tube containing water above the point. Most of these breeding places were dealt with at once while making the survey.

In the grounds generally breeding places were found in all clumps of banana examined, either in rotten stems or even in the healthy trees in the wet clefts between the petioles. Pine-apple plants provided many breeding places. Large trees were found to breed in collections of water in the forks, and in rot holes where branches had broken off or been cut. Much more frequently, however, breeding places were found near the ground level, on exposed roots.

B. Adult Anophelines.—The preliminary survey of the river and swamp waters had shown that anopheline breeding was going on all round the cantonment and in feeder streams arising in the barracks grounds. The survey of trees and shrubs had shown that while culicines were breeding in such sites in the barracks, anophelines were not breeding there. Search was next made for adult anophelines.

(i) *Officers' Quarters*.—Examination of the officers' quarters showed that *A. costalis* were entering the barracks to feed, they were present in small numbers in the quarters. *A. nili*, although breeding on the river margin close to the quarters, was not found in them.

(ii) *Native Houses*.—Adjacent to the first house of the officers' quarters is a house occupied by the family of a native servant. On several days in succession adults were searched for here, and were always captured in considerable numbers. Over 100 fed females of *Anopheles costalis* were caught altogether here and also one fed female of *Anopheles nili*. It is worthy of remark that this was the solitary occasion on which *Anopheles nili* was captured in a house. That this mosquito is prepared to feed on human beings was proved by the fact that on one occasion three out of

a number of bred specimens fed well, inflicting a bite which was not by any means painless; that is to say, that the bite would have attracted attention. It is not without interest, that whereas this native house daily contained numerous fed anophelines, the officer's house immediately adjacent to it, and the other officers' quarters remained comparatively free of anophelines; this appears to be the case even when due allowance is made for the size and height of the houses.

To sum up, the evidence from this survey of houses supported the belief that the anophelines which had made their way into the officers' houses had come from swamp A. Further, the evidence pointed to the fact that in their progress from the swamp in search of blood the female anophelines stopped at the first house they encountered and stayed there as a rule; there was, however, some tendency to overflow into the barracks quarters. The fact that the few native houses intervening between the swamps and the cantonment acted thus as a more or less efficient screen for the camp is important. Any feeling of security derived from this consideration must, however, be balanced against certain dangers which such a screen may give rise to, namely, the dangers of the overflow mosquitoes carrying infection with them from the infected natives.

C. Identification of Mosquitoes.—With the exception of numerous adult female *Anopheles costalis* and one female *Anopheles nili* captured, all the specimens identified were reared by me from pupæ or larvæ.

The identifications were made for me by Miss A. M. Evans, Liverpool School of Tropical Medicine. The Daru collection consisted of twenty-two species and included one new species and one new variety and several species which have not hitherto been recorded from Sierra Leone.

<i>Anopheles costalis</i>	...	...	...	Loew
<i>Anopheles mauritanus</i>	...	...	...	Grand
<i>Anopheles umbrosus</i>	...	...	...	Theo
<i>Anopheles nili</i>	...	...	...	Theo
<i>C. (Culicomyia) nebulosus</i>	...	...	...	Theo
<i>A. (Stegomyia) africanus</i>	...	...	...	Theo
<i>A. (Fintaya) longipalpis</i>	...	...	...	Grumb
<i>Eretmapodites chrysogaster</i>	...	...	...	Graham
<i>Tarorhynchites breripalpis</i>	...	...	...	Theo
<i>Aedes (Stegomyia) blacklocki</i>	...	...	...	N. Sp.
<i>A. (Aedimorphus) tarsalis</i>	...	...	...	Newst
<i>A. (Stegomyia) simpsoni</i>	...	...	...	Theo
<i>C. Decens</i> var. <i>invidiosus</i>	...	...	...	Theo
<i>Lutzia tigris</i> var. <i>fusca</i>	...	...	...	Theo
<i>A. (Aedimorphus) domesticus</i>	...	...	...	Theo
<i>A. (Stegomyia) apicoargenteus</i>	...	...	...	Theo
<i>Culex annulioris</i>	...	...	...	Theo
<i>Uranotaenia nigripes</i>	...	...	...	Theo
<i>Uranotaenia fusca</i>	...	...	...	Theo
<i>A. (Stegomyia) argenteus</i>	...	...	...	Poiret
<i>A. (Aedimorphus) cummingsi</i> var. <i>daruensis</i>	...	...	...	N. var
<i>Mimomyia hispida</i>	...	...	...	Theo

Reviewing these mosquitoes, the commonest anopheline found was *A. costalis*, which was breeding in both swamps A and B right down to their entrance to the river, in the hospital drain and in the stream between Headquarters line and A company lines. *Anopheles nili* was confined to the margin of the river. These two anophelines were the only ones captured in houses, and in the case of *A. nili*, only one specimen was so obtained. *Anopheles mauritanus* was found in Swamp B while *Anopheles umbrosus* was found in the upper portion of swamp A.

It is worthy of note that among the large number of mosquitoes collected *Aedes (Stegomyia) argenteus*, the proved carrier of yellow fever, was found only in one breeding place, that is, in the latrine bucket containing water. This rarity is probably due chiefly to the adequate measures adopted in the cantonment for the prevention of tins, bottles and other artificial receptacles acting as breeding places. But even so the absence of *Aedes argenteus* from tree and plant breeding places is remarkable; such breeding places harbour this species not infrequently in the neighbourhood of Freetown. It was observed

that the larvæ of megarhinines were usually found alone in small collections of water in trees and plants, and their predacious habits were also observed in breeding out experiments. It is possible that part of the scarcity of *Aedes argenteus* at Daru may be connected with the presence of such predaceous larvæ.

IV—MEASURES FOR REDUCING MOSQUITO BREEDING.

The steps taken to deal with the breeding places of mosquitoes must be considered largely from the point of view of cost. It would doubtless be possible, if expense were no object, to deal in a radical manner with the breeding places by large schemes of swamp drainage and filling. But such schemes, however desirable, are, it appears to me, quite out of the question at Daru at present. Instead therefore of suggesting large and comprehensive schemes, I propose to outline measures which will in a reasonable time and at moderate expenditure greatly diminish the risk of acquiring mosquito-borne diseases in the cantonment.

The first recommendation is that advantage should be taken of the assistance of the native troops in rendering the barracks and its environments more healthy. I would suggest that one native soldier be detailed each week to act as a mosquito hunter. His whole duty during the week should be to discover breeding places and having marked them down to report them. On his reporting a breeding place, action with regard to it should at once be taken. At the end of each week the man who is to be on duty for the succeeding week should spend two days with him in order to learn his duties.

The results of this procedure will be twofold; firstly, all breeding places will almost infallibly be discovered and dealt with which is in itself a matter of no small importance; secondly, the knowledge of how to look for, discover and deal with mosquito breeding places will extend steadily among the troops. Each individual will become imbued with ideas which will render him an extremely useful ally in the campaign against insect-borne diseases. The more clearly native troops in tropical countries grasp the essential elements of hygiene, the more efficient they will become as a fighting force, and nowhere is the truth of this statement more evident than in warfare in the African bush.

This educational policy I make the basis of all further action here; it is not a policy which could be carried out successfully in any casual community, but the community of Daru is not a casual one but a highly specialized one. In the circumstances there, I have no hesitation in recommending it as a practical policy which, conscientiously carried out, will produce good results. Its application will now be considered in conjunction with the other recommendations.

(a) MINOR OPERATIONS:

(i) Starting from the creek above the railway bridge the edge of the river should be denuded of grass and weed; this process should be carried out along the whole of the front of the barracks where it has not already been done. The side streams leading to the river from the high ground within this limit should be trained and cleared of grass and weed. All trees which have fallen into the river should be dealt with if they are in a position to afford lodgment of water. In case of a rise in the river level, any pools which form on the banks will be examined and reported on by the man on duty. In the dry season there is the additional problem of rock pools on the reef in the river bed. Owing to the high level of the river during my visit it is not possible for me to give in detail measures necessary to eliminate these; a statement is given based on experience of what appears to be similar conditions elsewhere. Wherever the rock pool has a sufficiently thin wall it should be drained permanently by breaking through the wall with a jumper-chisel and sledge hammer. Where the wall of the pool is too solid for such a treatment the pool should be emptied quite dry by syphonage or baling. Failing this resort may be had to filling in with concrete or to the use of oil or chemical treatment of the breeding places.

(ii) *Swamp A*.—The first step to be undertaken in the treatment of this swamp is the cutting of the bush along its margin from where the creek enters the river to the point where the stream passes under the railway near the clerk's house. Along this stretch the establishment of farms and gardens would keep the bush cleared from the railway line up to the edge of the swamp. A path, or if necessary, a series of paths should be kept parallel to the edge of the swamp so that it may be readily accessible to the soldier whose duty it is to inspect it for breeding places; these paths should be opened and kept open by each farmer on his particular ground. The edge of the swamp should be kept clean of grass and weeds; each farmer being responsible for that portion opposite his own farm.

The arm of swamp A which receives the hospital drain will be considered separately below, as it requires special attention.

(iii) *Swamp B.*—Most parts of this swamp are more remote from the barracks than is swamp A. At one point opposite the parade ground there is a stream in which anophelines breed; it is recommended that a good path be made from the parade ground down to and along this stream and that it should be continued to where the stream enters the swamp. The stream should be cleared of bush, grass and weed, and can then be properly and regularly examined by the soldier on duty. Along that portion of the swamp itself which lies opposite to the present and proposed new lines, the bush should be cleared and farms established on a similar basis to those along the edge of swamp A.

(iv) *Trees, Stumps and Shrubs.*—On the report of the discovery of a potential or actual breeding place in these sites, appropriate action should at once be taken to deal with them. The action will depend on the value of the tree or shrub. In case of stumps and trees of no economic, æsthetic or shade value, removal by felling and digging and blasting is the proper method, the ground being filled in and smoothed afterwards. Where for any reason it is desired to retain the tree or shrub, an outlet for all the water it contains should be cut and the cut surface tarred. Filling in holes with earth or concrete is not recommended except as a last resort in the case of trees of especial value which cannot be treated effectively by cutting a channel for the water, since spaces develop later, as the rot hole becomes larger, and breeding goes on between the filling and the tree hole walls.

(b) MAJOR OPERATIONS :

(i) *The Hospital Drain Area.*—As a temporary measure the wet triangular area inside the railway may be trenched so as to collect the water within definite limits. The water in the trenches and in the drain can then be treated with oil, but the permanent obliteration of this marshy area is necessary at the earliest possible time. This can be accomplished by filling in a triangle with its base on the railway and its apex extending to the foot of the slope down which the first portion of the hospital drain runs. As we saw the present level of the drain to the railway is too low, and the water becomes dammed back in it. The drain will therefore require to be relaid at such a level and with such a slope as will allow the water carried by it to pass under the railway and have a fall into the swamp beyond the embankment. In carrying out this operation all material for filling it should be collected and the filling is carried out from without inwards, leaving the drain itself to be dealt with as the last part of the operation.

The proper level to which the ground must be raised will have to be determined by a skilled engineer. In the filling in of this area the Railway Department could render valuable assistance by surveying the ground and by supplying material for filling. The work could best be carried out in the dry season, but the contingency of exceptional high water in the swamp, as for example, this year should be provided for fully in deciding the height of filling required. The only essential points are, that the marshy area should be eliminated, that the drain should have a good slope, and that it should have a definite fall into the swamp, even when the water in the swamp stands at an exceptionally high level.

(ii) *Permanent Improvement of Swamp A.*—The above operation having been completed, it is advisable to adopt a definite policy with regard to swamp A. The policy which appears to hold out the best prospects of success is to make a steady and progressive encroachment on the swamp from the railway outwards. By the time this stage is reached the process of clearing should have so far advanced as to make it possible to define the best limiting line along which filling can be done, so as to leave a straight edge to the reclaimed land beyond which the water of the swamp can be constantly kept. It is here above all that the greatest assistance can be given by the Railway Department. In fact it does not appear probable that much can be done in this direction without the active co-operation of that department; with this co-operation much could be done. The method of co-operation suggested is that the engineer should determine the best line to leave for the swamp water, and that a siding should be made in which trucks of earth, ashes, stones or other waste material provided by the Railway Department, could stand while their contents are being discharged. The labour required for unloading, transporting the material, and filling in should be provided by the military authorities.

In the case of Daru I think that if the scheme of filling in swamp A is adopted a very useful way of disposal of the majority of the camp refuse would be to utilize it for filling in this swamp. There is an incinerator of small size which can be used for kitchen refuse. The remainder of the camp refuse should be taken to the margin of swamp A and treated there. The treatment will consist of separating all combustible material and burning it. The incombustible material can be disposed of as follows:—The material supplied by the Railway having been filled in along a section of the edge of the swamp sufficiently high to raise it above water level, the refuse is laid on in a layer of about 2 feet thick. This is then covered with a layer of a foot or so of soil and pressed down firmly. In this way a waste product is turned to good account in the sanitation of the

cantonment. A small amount of kerosene sprinkled on the refuse before burial would help to prevent fly breeding and by oozing gradually into the swamp and act as a useful anti-mosquito agent. The subsidence in the trenched area which will gradually occur can be rectified later by the deposit on the surface of soil from the filling in material supplied by the Railway.

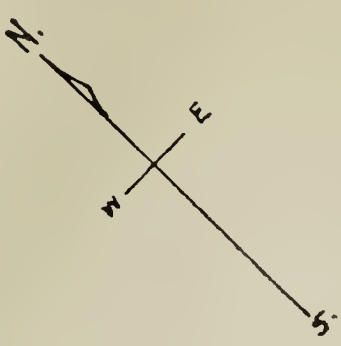
SUMMARY.

- (1) A description is given of the site of the military cantonment, Daru.
- (2) A mosquito survey including breeding traps, collection of adults and breeding out from larvæ and pupæ, was carried out. In this way four species of anophelines and eighteen species of non-anopheline mosquitoes were discovered breeding in or about the barracks.
- (3) Of the twenty-two species collected or bred, one was a new species and one a new variety of a species, while several had not been recorded previously from Sierra Leone.
- (4) Of the four species of anopheles, *A. costalis*, *A. nili*, *A. mauritanus* and *A. umbrosus*, *A. costalis* was that found in houses frequently. *A. nili* was the only other anopheline found in houses and that a single specimen. The rarity of *A. nili* in houses is noteworthy since it was breeding freely quite near the officers' houses on the Moa river.
- (5) Measures to eradicate or reduce breeding places are outlined; these measures are directed more against *A. costalis* breeding grounds in the swamps and the river breeding places of anophelines.
- (6) A method of enlisting the assistance of native troops in carrying out anti-mosquito work is proposed.



DARU MILITARY CANTONMENT

Houses marked with red An. costalis found



PROPOSED
NEW LINES

Parade Ground.

A. mauritiana

A Coy
Lines

A Coy
Lines

Present Headquarters
Lines

OFFICES

OFFICERS' HOUSES

Prayer
House

OFFICERS' HOUSES

Servant's
House

Servant's House

RIVER MOA

Anopheles nili

A. costalis

BRIDGE

Farmers Hut

Gardener's
Hut

Native Servant's
Huts

Mailamma
Village

DENSE BUSH

SWAMP A

SWAMP B

A. costalis

A. nili

Anopheles
umbrosus

A. costalis

A. costalis

open origin over flow
GULLY

N.C.O.'s Houses

Hospital

A. costalis

A. nili



